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# AN ECONOMIC ANALYSIS OF CHEESE FACTORY OPERATIONS IN ONTARIO

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OF THE
HON. ROBERT WEIR, DOMINION MINISTER OF AGRICULTURE
AND THE
HON. THOMAS L. KENNEDY, ONTARIO MINISTER OF AGRICULTURE
OTTAWA, NOVEMBER, 1933

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# FOREWORD

AT a conference called by the Hon. Robert Weir, Minister of Agriculture for Canada, and held in Toronto, August 29 to September 1, 1932, a committee was appointed to consider the matter of spreads in the processing and marketing of dairy products. This committee included in its report the recommendation that an economic survey of the cost of operating cheese factories in Ontario and Quebec be undertaken and that this be followed by similar studies dealing with other phases of dairy marketing.

Acting upon this recommendation a meeting, attended by representatives of the Federal Government and Provincial Governments of Ontario and Quebec was held in Ottawa early in October to formulate plans for a cheese factory survey. At this meeting and in the conduct of the Ontario project which resulted therefrom, the Federal Department of Agriculture was represented by J. F. Singleton, Dairy Commissioner, J. F. Booth, Commissioner of Economics, J. Coke, Assistant Commissioner of Economics, C. V. Parker, Field Assistant; the Ontario Department of Agriculture by Geo. H. Barr, Director of Dairying, and the Ontario Agricultural College by F. C. Hart, Professor of Economics.

NOTE.—Additional copies of this report may be obtained from the Publications Branch, Ontario Department of Agriculture, Toronto, Ontario.

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# AN ECONOMIC ANALYSIS OF CHEESE FACTORY OPERATIONS IN ONTARIO[1]

## INTRODUCTION

The manufacture of cheese in factories in Ontario dates from about 1864 when the first factory in Canada is reported to have been established. During the ensuing several decades hundreds of such factories were built in the province. The census of 1901 reports 1,233 factories then in operation producing cheese, of which 172 also produced butter. In the Dominion as a whole at that time there were 2,947 factories of which 558 made both butter and cheese.

The output of cheese throughout this period increased in keeping with the increase in number of factories. In 1900, according to the census of the year following, the output of Ontario factories amounted to 131,967,612 pounds which, added to the production of other provinces, gave a total output for the Dominion of 220,833,269 pounds. Although production figures are not available for years immediately succeeding 1900, the record of exports for the year ending June 30, 1904, as reported by the Dominion Dairy Branch, totalled 233,980,716 pounds which is taken to indicate that the production of 1903 was the largest in the history of the industry.

Since that time there has been a significant decline in both number of factories and output of cheese. In 1931 the total number of factories in Ontario, according to the Dominion Bureau of Statistics, was 714 of which 37 were " combined " factories making both butter and cheese. For the same year the total number of factories in Canada was 1,338, including 195 combined factories.

The production of cheese in Ontario in 1931 is given by the same authority as 84,010,148 pounds and that for the Dominion as a whole 113,526,588 pounds.

The changed conditions which have brought about this decline in volume of output have also been responsible for changes in production and manufacturing conditions. Indeed it might be said that the problems faced by the industry have increased about in proportion to the decline in business. The industry is still of major importance, however, and demands recognition in any program of research designed to improve dairying as a whole.

The problems with which the industry is now concerned deal with both manufacturing and marketing but in this study only those bearing upon the manufacture of cheese have been dealt with.

Before proceeding to an analysis of the data a brief outline of the principal problems, concerning which a solution is sought, will be given.

---

[1] Those assisting with field work and analysis of data in connection with this project were W. E. Browne, Dairy Branch, Ottawa; L. A. Zufelt, Superintendent, Dairy School, Ontario Department of Agriculture, Kingston; F. Herns, Dairy Branch, Ontario Department of Agriculture, London, Ontario; W. J. Fairweather and W. S. Rowe, Economics Department, Ontario Agricultural College. The supervision of the work was entrusted to J. F. Booth and C. V. Parker, Economics Branch, Department of Agriculture, Ottawa. The committee and those entrusted with the conduct of the survey are greatly indebted to local instructors of the Dairy Branch, Ontario Department of Agriculture, and to owners of factories, makers and officials of local associations for assistance rendered in connection with the undertaking.

## PURPOSE AND EXTENT OF SURVEY

In the establishment of cheese factories it has always been necessary to give consideration to the distance which milk could be hauled daily. In the early period of development, and even yet in most areas, that meant the distance that a farmer could haul his milk in a horse-drawn vehicle each morning. In consequence the area served by a given factory, particularly in Eastern and Central Ontario, was comparatively small and the distance between factories often but a few miles. The majority of patrons lived within two miles of a factory.

With the development of large urban centres and increased demand for milk for fluid consumption and for use in the manufacture of other dairy products, the production of cheese declined. Paralleling this development came improved means of transportation and better roads; the net effect of this combination of circumstances on the cheese factories was increased competition and declining volume of business.

In seeking a solution to the problem thus raised the suggestion has frequently been made that cheese factory districts should be consolidated and many of the factories closed. This, it is held, would give to the remaining factories sufficient volume to enable them to operate at lower costs. Those favouring such a development point to the fact that in Western Ontario and elsewhere, where large factories are in operation, manufacturing costs per pound of cheese are considerably lower than prevail in the majority of small factories.

On the other hand, those opposing the enlargement of factories and factory areas point to what are held to be a number of advantages possessed by the small unit, including closer supervision and contrôl by patrons. They also contend that in many areas the topography and climate make long hauls difficult and discourage operations during winter months. It is held too, that the cheese factory is a community enterprise of considerable significance and that to deprive a community of such an institution would not be desirable.

Other arguments for and against the enlargement of factories and consolidation of producing districts have been advanced from time to time but those enumerated will serve to indicate the nature of the problem to which departments and colleges of agriculture have been forced to give consideration in recent years.

It should be understood that this study was not undertaken with the sole object of deciding definitely and for all time whether or not consolidation and enlargement of factories is desirable. It is appreciated that the attention of those interested in cheese production has been focussed intently on this question but it should be recognized that there are possibilities of effecting improvements in the operation of factories without reference to consolidation. With that in mind the scope of the survey was made broad enough to cover various phases of cheese factory operation. In addition to operating costs information was obtained dealing with amounts received by cheese makers, net returns to patrons, prices, cost of hauling milk by individual farmers and by milk routes, the effect of volume on quality of cheese produced, and the results obtained under different systems of ownership and operation. These data are enumerated and discussed in succeeding pages.

## PERIOD OF FACTORY DEVELOPMENT

As already stated the first cheese factory in Canada was built in 1864.[1] Thereafter the development of the industry was rapid. In 1871 (Table 1) the number of factories in operation was 323, the total increasing during each decade until the close of the period reported in the 1901 census. Since that time there has been a steady decline.

---

[1] Statistics of Dairy Factories, Dominion Bureau of Statistics, 1931.

TABLE 1.—Number Of Cheese Factories and Combination Cheese and Butter Factories in Ontario 1871-1931[1]

| Year | Number of Factories |
|---|---|
| 1871 | 323 |
| 1881 | 551 |
| 1891 | 893 |
| 1901 | 1,233 |
| 1911 | 1,128 |
| 1921 | 838 |
| 1931 | 714 |

[1] 1871 to 1911, from Census of Canada, 1871-1911. 1921 and 1931, from Statistics of Dairy Factories, Dominion Bureau of Statistics, 1922 and 1931.

Included among the 125 factories studied in this survey was one factory from Oxford county which was said to have been erected in 1864. The latest date any factory was built, according to the sample, was in the year 1927. Information as to date of construction was recorded for 117 factories and of these only 14 were built after 1900. By far the largest number were erected before 1900, and the most rapid development in factory building occurred in the 1890-99 period.

TABLE 2.—Building History of 125 Factories Included in Survey 1931

| Year Built | Number of Factories | Number Since Rebuilt | Rebuilding, cause of: | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Fire | | Remodelling | | New Sites | | Wind | |
| | | | Number | Average Years Use Before Rebuilding | Number | Average Years Use Before Remodelling | Number | Average Years Use Before Moving | Number | Average Years Use Before Destruction |
| Before 1870 | 1 | 1 | 1 | 62 | | | | | | |
| 1870-79 | 19 | 11 | 3 | 48 | 5 | 33 | 3 | 36 | | |
| 1880-89 | 20 | 8 | 4 | 39 | 2 | 16 | 2 | 12 | | |
| 1890-99 | 34 | 9 | 6 | 19 | 1 | 17 | 2 | 24 | | |
| 1900-09 | 29 | 1 | 1 | 20 | | | | | | |
| 1910-19 | 7 | | | | | | | | | |
| 1920-29 | 7 | | | | | | | | | |
| No record | 8 | 5 | 3 | | 1 | | | | 1 | |
| Total or average | 125 | 35 | 18 | 36 | 9 | 27 | 7 | 26 | 1 | |

## Rebuilding of Factories

In view of the fact that most of the factories were constructed of wood and that the majority have been in operation for 30 years or more, it would seem probable that many would have been rebuilt at some time during the period. However, in only 35 of the 125 cases was it found necessary to rebuild; of these 9 were remodelled, 18 were reconstructed because of fire, 7 were removed to new sites and rebuilt and in one instance, wind damage was the cause of rebuilding. All but one of the factories which had to be rebuilt were constructed before the year 1900. Factories destroyed by fire had been erected for an average period of 36 years before the fire took place. Remodelling occurred after an average period of 27 years and factories were moved to new sites 26 years after they were first built on the average. Very nearly 40 per cent of the factories constructed before 1900 were reconstructed. It is probable that even though wind damage, removal to new sites or fires had not occurred, some of the factories would have required rebuilding.

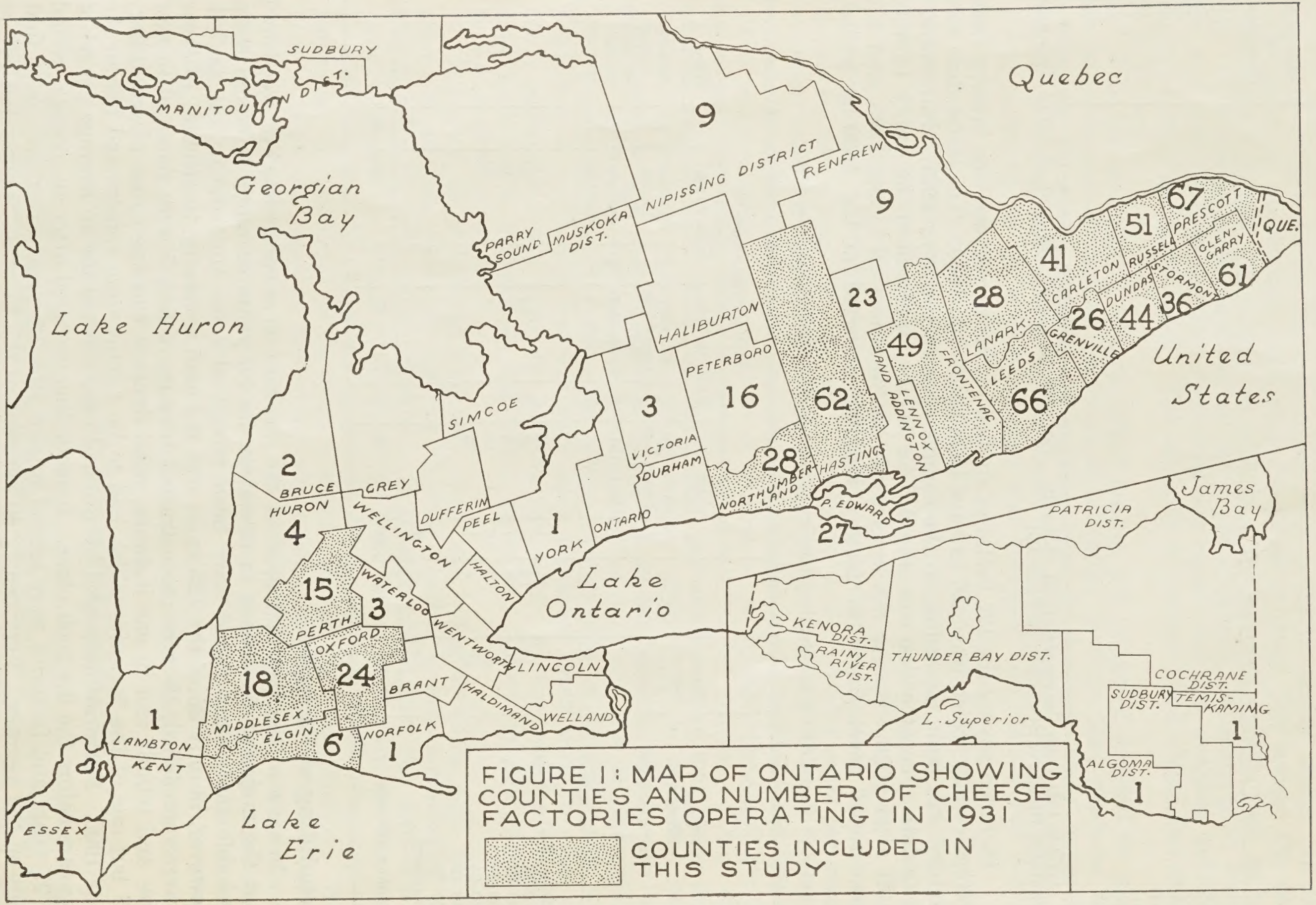

FIGURE I: MAP OF ONTARIO SHOWING COUNTIES AND NUMBER OF CHEESE FACTORIES OPERATING IN 1931

### Type of Factory Building

Altogether, 94 of the 125 factories, or 75·2 per cent, were of frame construction while 11·2 per cent were brick, 8·8 per cent cement block, 2·4 per cent concrete, ·8 per cent stone, ·8 per cent metal and ·8 per cent brick and frame.

TABLE 3.—Type of Factory Building

| —— | Number | Per Cent |
|---|---|---|
| Frame | 94 | 75·2 |
| Brick | 14 | 11·2 |
| Cement block | 11 | 8·8 |
| Concrete | 3 | 2·4 |
| Stone | 1 | ·8 |
| Metal | 1 | ·8 |
| Brick and frame | 1 | ·8 |
| Total | 125 | 100·0 |

## LOCATION OF FACTORIES

In table 4 the location of the factories included in the survey is given. In making the selection an attempt was made to give adequate representation to the factories in the three major producing areas. Eastern Ontario is represented by 68 factories, Central Ontario by 30 and Western Ontario by 27 factories. For the distribution of cheese factories throughout Ontario in 1931 see Figure 1.

TABLE 4.—Distribution of 125 Ontario Cheese Factories Included in 1932 Survey by Counties and Size of Factory

| Counties | Size of Factory (Tons) | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25 to 49.9 | 50 to 74.9 | 75 to 99.9 | 100 to 124.9 | 125 to 149.9 | 150 to 174.9 | 175 and Over | |
| Eastern Ontario | 4 | 28 | 23 | 7 | 2 | 3 | | 1 | 68 |
| Prescott | 1 | 9 | 4 | 3 | 1 | | | | 18 |
| Glengarry | 2 | 8 | 1 | | | | | | 11 |
| Russell | | 4 | 3 | 1 | | | | | 8 |
| Stormont | | | 1 | | | | | | 1 |
| Carleton | | 1 | 2 | 1 | | | | | 4 |
| Dundas | | 3 | 1 | 1 | | 1 | | | 6 |
| Grenville | 1 | 1 | 5 | | | | | | 7 |
| Lanark | | 1 | 5 | 1 | | 1 | | | 8 |
| Leeds | | 1 | 1 | | 1 | 1 | | 1 | 5 |
| Central Ontario | 2 | 7 | 13 | 4 | 2 | | 2 | | 30 |
| Frontenac | | 2 | 4 | 2 | 1 | | 2 | | 11 |
| Hastings | 2 | 2 | 7 | 1 | 1 | | | | 13 |
| Northumberland | | 3 | 2 | 1 | | | | | 6 |
| Western Ontario | | | 1 | | 8 | 4 | 6 | 8 | 27 |
| Perth | | | | | 1 | 2 | | 2 | 5 |
| Oxford | | | | | 5 | 1 | 3 | 4 | 13 |
| Middlesex | | | 1 | | 2 | 1 | 2 | 1 | 7 |
| Elgin | | | | | | | 1 | 1 | 2 |
| Grand total | 6 | 35 | 37 | 11 | 12 | 7 | 8 | 9 | 125 |

The number of factories studied, namely 125, is about 18 per cent of the total number of factories that reported to the Dominion Bureau of Statistics in 1931. In the matter of size it will be observed that factories cover a considerable range. Thus, in the selection of a sample the three main requirements, namely, number of records, size of business and location of factories, appear to have been taken into consideration.

## VOLUME OF BUSINESS

### Production of Cheese

Total output of cheese produced per factory has been taken as the measure of size of business conducted in Ontario cheese factories. Capital investment, receipts, expenses, number of patrons and pounds of milk delivered are all general indications of the amount of business transacted but their relationship to volume, when individual factories are compared, may vary considerably.

Factories were arranged in order of tons of cheese produced and from lowest to highest the range was from 19·4 to 294 tons. They were then classified into groups of production, the class or group interval being 25 tons of cheese.

The majority of factories were making between 25 and 75 tons of cheese but with 47 of the 125 producing 75 tons or over, the average for all factories was raised to 81·47 tons. (Table 5.)

### Volume of Milk Received

A further indication of the size of business in Ontario factories is the volume of milk received per factory. Many factors influence the volume of milk received and thus the size of business. First and foremost is the number of patrons delivering milk. Directly connected with this is the size of business of the individual patron, i.e., number of cows kept and productivity per cow. The productivity of cows depends in part on the fertility of the area and also on the breeding and management of the herd. Intensified dairying cannot be carried on economically when suitable feeds cannot be grown in abundance. Another factor influencing the volume of milk delivered per factory is the competition for milk for other uses. Patrons residing within the natural boundary of a cheese factory district, who ship milk to city plants, creameries and condensaries materially reduce the volume available to a particular factory.

TABLE 5.— Classification of Factories According to Volume of Cheese Produced

| Size of Factory (tons of cheese) | Number of Factories | Average Pounds of Cheese per Factory | Average Tons of Cheese per Factory |
|---|---|---|---|
| Under 25 | 6 | 44,960 | 22·48 |
| 25— 49·9 | 35 | 73,191 | 36·60 |
| 50— 74·9 | 37 | 120,859 | 60·43 |
| 75— 99·9 | 11 | 172,877 | 86·44 |
| 100—124·9 | 12 | 231,457 | 115·73 |
| 125—149·9 | 7 | 259,610 | 129·80 |
| 150—174·9 | 8 | 318,695 | 159·35 |
| 175 and Over | 9 | 446,520 | 223·26 |
| Total or average | 125 | 162,941 | 81·47 |

In table 6 the relationship of pounds of milk delivered per factory, per cow and per patron to factories of different sizes is indicated. The low amount delivered per cow in districts with small factory output is significant. An average of 4,044 pounds of milk per cow is too low in areas where dairying has a natural advantage over other types of farming, particularly when it is realized that production per cow can be increased by improving the breeding of the herd. In table 14 it is shown that the average period factories were open was 8 months but with production arranged to cover this period the average production per cow should be higher. In a later section dealing with costs of production it will be shown that volume of business directly affects the cost of producing cheese. Much could be done to lower costs in Ontario factories, even with the present number of patrons and cows per factory, by increasing the output per cow and thus increasing the volume per factory. This point is also more clearly emphasized in a later section dealing with returns per hundredweight of milk.

The average receipts of factories was 1,740,806 pounds of milk per year. Each patron contributed an average of 48,859 pounds from 12·1 cows. The number of cows per factory ranged from 221, for those of smallest size, to 960 for those of largest output. The average number of cows was 430·5 per factory.

TABLE 6.—Relation of Size of Factory to Number of Patrons and Number of Milk Cows

| Size of Factory | Number of Factories Reporting Data | Total Number of Patrons | Number of Cows |  |  | Pounds of Milk Delivered |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
|  |  |  | Total | Per Factory | Per Patron | Total | Per Factory | Per Patron | Per Cow |
| Under 25......... | 6 | 113 | 1,327 | 221·2 | 11·7 | 3,142,758 | 523,793 | 27,812 | 2,368 |
| 25— 49·9........ | 35 | 890 | 9,814 | 280·4 | 11·0 | 28,819,882 | 823,425 | 32,382 | 2,937 |
| 50— 74·9........ | 36 | 1,295 | 13,752 | 382·0 | 10·6 | 49,921,582 | 1,386,711 | 38,549 | 3,630 |
| 75— 99·9........ | 10 | 395 | 5,140 | 514·0 | 13·0 | 19.655,728 | 1,965,573 | 49,761 | 3,824 |
| 100—124·9........ | 10 | 415 | 5,485 | 548·5 | 13·2 | 27,110,313 | 2,711,031 | 65,326 | 4,943 |
| 125—149·9........ | 6 | 303 | 3,705 | 617·5 | 12·2 | 18,460,969 | 3,076,828 | 60,927 | 4,983 |
| 150—174·9........ | 8 | 442 | 5,907 | 738·4 | 13·4 | 29,921,577 | 3,740,197 | 67,696 | 5,065 |
| 175 and over...... | 5 | 280 | 4,803 | 960·6 | 17·2 | 24,900,730 | 4,980,146 | 88,931 | 5,184 |
| Total or average.. | 116 | 4,133 | 49,933 | 430·5 | 12·1 | 201,933,539 | 1,740,806 | 48,859 | 4,044 |

## Total Sales

The total cheese sales, f.o.b. local shipping point, of the factories included in the study amounted to $2,221,186.66. A sum of $3,053.16 was paid by 36 factories for hauling cheese to railway stations which, when deducted, gives a net return for cheese amounting to $2,218,133.50. In the remaining 89 factories patrons drew the cheese free of cost to the shipping point. Sales per factory thus averaged $17,745.07. The amount varied from an average of $5,034.44 in factories of the smaller group to $48,193.39 for factories in the larger size group.

Besides the income from sales of cheese an average of $588.33 per factory was derived from the sale of whey cream or butter, by-products of the industry. For the 125 factories the total value of this product was $73,541.25; other receipts, mainly skim milk, brought in an average of $75.26 per factory which gives a total from all sources of $18,408.65 for each plant.

TABLE 7.—Total Sales of Cheese and Average Returns per Factory for Cheese, Whey Product and from Other Sources by Size of Factory

| Size of Factories (tons of cheese) | Number of Factories | Total Return for Cheese | Cash Paid for Cheese Hauling | Returns less Hauling | Average Returns per Factory |  |  |  |
|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | Cheese less Hauling | Whey Product | Other Receipts | Total Receipts |
|  |  | $ | $ | $ | $ | $ | $ | $ |
| Under 25...... | 6 | 30,206 61 | — | 30,206 61 | 5,034 44 | 31·68 | 2 73 | 5,068 85 |
| 25— 49·9..... | 35 | 292,125 75 | 868 93 | 291,238 82 | 8,321 11 | 120 47 | 1 09 | 8,442 65 |
| 50— 74·9..... | 37 | 500,203 33 | 866 51 | 499,336 82 | 13,495 59 | 329 71 | 56 | 13,825 87 |
| 75— 99·9..... | 11 | 212,520 62 | 186 37 | 212,334 25 | 19,303 11 | 669 26 | — | 19,972 37 |
| 100—124·9..... | 12 | 281,124 01 | 333 27 | 280,690 74 | 23,390 89 | 897 80 | 93 90 | 24,382 60 |
| 125—149·9..... | 7 | 197,992 29 | 300 76 | 197,691 53 | 28,241 65 | 1,036 97 | 85 23 | 29,363 85 |
| 150—174·9..... | 8 | 273,029 36 | 135 14 | 272,894 22 | 34,111 78 | 1,205 04 | 927 44 | 36,244 26 |
| 175 and over... | 9 | 434,084 69 | 344 18 | 433,740 51 | 48,193 39 | 2,433 37 | 20 99 | 50,647 75 |
| All Factories | 125 | 2,221,186 66 | 5,053 16 | 2,218,133 50 | 17,745 07 | 588 33 | 75 26 | 18,408 65 |

## NUMBER OF PATRONS

The number of patrons per factory is an indication of the size of business and the area served per factory. The distribution of patrons according to size of factory is shown in table 8. The six smallest factories had an average of only 18·8 patrons while the factories producing over 175 tons of cheese had an average of 73·9 patrons per factory. The largest number of patrons reported per factory was 112, the smallest number 11, and the average for all factories was 39·2.

TABLE 8.—Distribution of Patrons According to Size of Factory

| Size of Factory (tons of cheese) | Number of Factories | Number of Patrons | |
|---|---|---|---|
| | | Total | Average per Factory |
| Under 25 | 6 | 113 | 18·8 |
| 25— 49·9 | 35 | 890 | 25·4 |
| 50— 74·9 | 37 | 1,344 | 36·3 |
| 75— 99·9 | 11 | 445 | 40·5 |
| 100—124·9 | 12 | 594 | 49·5 |
| 125—149·9 | 7 | 407 | 58·1 |
| 150—174·9 | 8 | 442 | 55·3 |
| 175 and over | 9 | 665 | 73·9 |
| Total or average | 125 | 4,900 | 39·2 |

That the number of patrons per factory is an indication of size of business is also brought out by a comparison of data in Table 9. Ten of the factories had under twenty patrons, the smallest number in this group being eleven. A total of 60·8 per cent had under forty patrons per factory, 20 per cent had 40-49 patrons, 16 per cent 50-59, and 13 per cent had over 60 patrons.

TABLE 9.—Distribution of Factories According to Number of Patrons Delivering Milk

| Number of Patrons | Number of Factories | Per cent in Each Class |
|---|---|---|
| Under 20 | 10 | 8·0 |
| 20—29 | 41 | 32·8 |
| 30—39 | 25 | 20·0 |
| 40—49 | 20 | 16·0 |
| 50—59 | 16 | 12·8 |
| 60 and over | 13 | 10·4 |
| Total | 125 | 100·0 |

### Distance Patrons Deliver Milk

In the first two factory groups (Table 10) 87·6 and 88·2 per cent of the patrons respectively lived within two miles of the factory and of this number nearly one-half lived within one mile. Only eleven of the 1,003 patrons in these two groups of factories lived over 3 miles from the factory. As the factories increased in size the area extended and the proportion of patrons living within one and two miles distance decreased. The farthest any patron lived from a factory was 6 miles, and only 0·3 per cent, or 14 out of 4,133 lived that far away. The average for all factories indicates that 75·7 per cent of the patrons lived within two miles, 16·3 per cent three miles, 5·9 four miles, 1·8 five miles and ·3 six miles from the factories. (See also figure 2.)

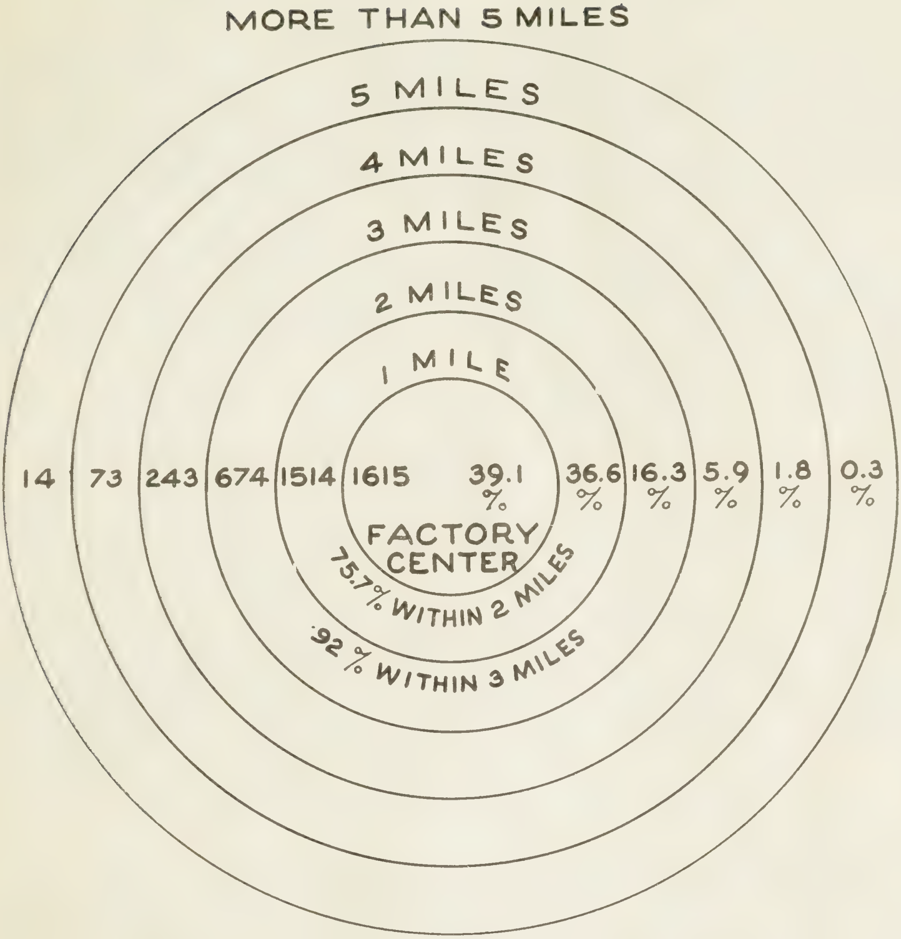

Figure 2.—Distribution of Patrons from Cheese Factory Center.
NOTE.—Information is for 4,133 patrons in 116 factories.

TABLE 10.—Distribution of Patrons According to Distance from the Factory

| Size of Factory | Number Factories Reporting | Total Patrons | Distance Patrons Live from the Factory (miles) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 Mile | | 2 Miles | | 3 Miles | | 4 Miles | | 5 Miles | | 6 Miles | |
| | | | No. | Per Cent | No. | Per Cent | No. | Per Cent | No. | Per Cent | No. | Per Cent | No. | Per Cent |
| Under 25 | 6 | 113 | 54 | 47·8 | 45 | 39·8 | 14 | 12·4 | .... | ...... | .... | ...... | .... | ...... |
| 25— 49·9 | 35 | 890 | 456 | 51·2 | 329 | 37·0 | 94 | 10·6 | 11 | 1·2 | .... | ...... | .... | ...... |
| 50— 74·9 | 36 | 1,295 | 472 | 36·4 | 448 | 34·6 | 222 | 17·1 | 106 | 8·2 | 36 | 2·8 | 11 | ·8 |
| 75— 99·9 | 10 | 395 | 168 | 42·5 | 142 | 35·9 | 54 | 13·7 | 31 | 7·8 | .... | ...... | .... | ...... |
| 100—124·9 | 10 | 415 | 144 | 34·7 | 141 | 34·0 | 100 | 24·1 | 20 | 4·8 | 9 | 2·2 | 1 | ·2 |
| 125—149·9 | 6 | 303 | 107 | 35·3 | 108 | 35·6 | 34 | 11·2 | 32 | 10·6 | 22 | 7·3 | .... | ...... |
| 150—174·9 | 8 | 442 | 128 | 28·9 | 181 | 40·9 | 101 | 22·9 | 24 | 5·4 | 6 | 1·4 | 2 | ·5 |
| 175 and over | 5 | 280 | 86 | 30·7 | 120 | 42·9 | 55 | 19·6 | 19 | 6·8 | .... | ...... | .... | ...... |
| Total or Average | 116 | 4,133 | 1,615 | 39·1 | 1,514 | 36·6 | 674 | 16·3 | 243 | 5·9 | 73 | 1·8 | 14 | ·3 |

## CAPITAL INVESTED

The total capital invested in the 125 factories included in the survey was found to be $588,833, or an average of $4,710.66 per factory (table 11). Of this amount land made up 1·77 per cent or an average of $83.55, factory building 52·19 per cent or an average of $2,458.21 and equipment 46·04 per cent or an average of $2,168.94 per factory. The relationship between volume of business and investment in buildings and equipment is of interest; the amount expended for such purposes increased with each increase in output up to 125 tons. From thereon increases were slight or not apparent. The fact that 175 tons of cheese or over was being produced with approximately the same capital investment as 125—149·9 tons clearly shows that maximum production is not being reached in some Ontario factories. Apparently many factories could produce a greater volume with present facilities.

TABLE 11.—Total, Average and Percentage Capital Invested in Land, Buildings and Equipment

| Size of Factory (tons of cheese) | Number of Factories | Land | | | Buildings | | | Equipment | | | Average Total Capital |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Average | Per Cent | Total | Average | Per Cent | Total | Average | Per Cent | |
| | | $ | $ | | $ | $ | | $ | $ | | $ |
| Under 25.... | 6 | 275 | 45·83 | 2·71 | 4,700 | 783·33 | 46·31 | 5,173 | 862·17 | 50·98 | 1,691·33 |
| 25— 49·9... | 35 | 2,274 | 64·97 | 2·46 | 50,866 | 1,453·31 | 54·95 | 39,422 | 1,126·34 | 42·59 | 2,644·62 |
| 50— 74·9... | 37 | 2,540 | 68·65 | 1·70 | 77,375 | 2,091·22 | 51·76 | 69,582 | 1,880·59 | 46·54 | 4,040·46 |
| 75— 99·9... | 11 | 640 | 58·18 | 1·04 | 32,235 | 2,930·45 | 52·26 | 28,811 | 2,619·18 | 46·70 | 5,607·81 |
| 100—124·9... | 12 | 875 | 72·92 | 1·14 | 40,100 | 3,341·67 | 52·47 | 35,448 | 2,954·00 | 46·38 | 6,368·59 |
| 125—149·9... | 7 | 810 | 115·71 | 1·50 | 26,200 | 3,742·86 | 48·68 | 26.812 | 3,830·28 | 49·82 | 7,688·85 |
| 150—174·9... | 8 | 800 | 100·00 | 1·06 | 41,900 | 5.237·50 | 55·60 | 32,666 | 4,083·25 | 43·34 | 9,420·75 |
| 175 and over | 9 | 2,225 | 247·22 | 3·20 | 33,900 | 3.766·66 | 48·90 | 33,204 | 3,689·33 | 47·89 | 7.703·21 |
| Total........ | 125 | 10,439 | 83·51 | 1·77 | 307,276 | 2,458·21 | 52·19 | 271,118 | 2,168·94 | 46·04 | 4,710·66 |

### Relation of capital Investment to volume of Business

A very noticeable reduction occurred in the investment per pound of cheese as the volume of output of cheese increased. Factories producing less than 25 tons of cheese had an average capitalization of 3·76 cents per pound of cheese while factories making 175 tons or over had only 1·73 cents invested per pound of cheese, a difference of 2·03 cents per pound. (Table 12). The average investment per pound of cheese for all factories was 2·89 cents. The pronounced reduction in investment per unit of production in the larger factories would obviously lower the costs of production in these factories. This phase will be discussed later under " Cost of Production."

TABLE 12.—Capital Invested per Pound of Cheese. Classified according to size of Factory.

| Size of Factory | Number | Capital Cents Pound of Cheese | Size of Factory | Number | Capital Cents Pound of Cheese |
|---|---|---|---|---|---|
| Under 25 tons............ | 6 | 3·76 | 125—149·9.............. | 7 | 2·96 |
| 25— 49·9................ | 35 | 3·61 | 150—174·9.............. | 8 | 2·96 |
| 50— 74·9................ | 37 | 3·34 | 175 and over............ | 9 | 1·73 |
| 75— 99·9................ | 11 | 3·24 | | | |
| 100—124·9................ | 12 | 2·75 | Total............... | 125 | 2·89 |

## OWNERSHIP AND OPERATION OF FACTORIES

The ownership of Ontario factories falls into two classes (1) Privately owned; (2) Patron owned. The patron owned factories include both joint-stock and co-operative concerns. Ownership is vested almost entirely with the patrons in both classes though in joint-stock factories generally a smaller proportion of the total patrons delivering milk have an interest in the business.

The ownership and operation of Ontario cheese factories may be classified in the following way:—

(1) Private Ownership.

(*a*) Operated by owner who is cheesemaker and who contracts with the patrons and makes cheese at a stated price per pound. Such contract is usually made at a meeting held prior to the commencement of the season's operations.

(*b*) Operated by salaried maker, or at a rate per hundredweight of cheese paid by the owner who supplies everything except labour. The arrangements between owner and patrons are the same as in (*a*).

(2) Patron Ownership.

(*a*) Contract operation by which the group owning the factory supplies the building and equipment only, and contracts with the maker at a rate per hundredweight, the latter furnishing all labour and supplies.

(*b*) Hired operation by which the group of owners buy all the supplies and pay the cheesemaker on a monthly, seasonal or hundredweight basis. The maker in this case only furnishes the extra labour required.

Type of ownership and method of operation of factories varies somewhat in the three districts. The proportion of privately owned to patron owned factories is very nearly two to one in Eastern Ontario. In the Central Region the proportion is reversed and in Western Ontario both types of ownership have approximately equal representation.

TABLE 13.—Ownership and Operation of Factories by Districts.

| District | Number of Factories | Privately Owned | | | Patron Owned | | |
|---|---|---|---|---|---|---|---|
| | | Owner Maker | Hired Maker | Total | Hired Maker | Contract Maker | Total |
| Eastern | 68 | 35 | 6 | 41 | 27 | .......... | 27 |
| Central | 30 | 9 | 1 | 10 | 3 | 17 | 20 |
| Western | 27 | 12 | 1 | 13 | .......... | 14 | 14 |
| Totals | 125 | 56 | 8 | 64 | 30 | 31 | 61 |

Practically all of the privately owned factories were operated by the owners themselves, only 8 of the 64 factories employing hired makers.[1] No contract makers were employed in privately owned factories. Patron owned factories, however, were operated by both hired and contract makers. In the Eastern section all 27 factories had hired makers, in the central only 3 out of the 20 were on a "hired" basis and Western Ontario patron factories all employed makers by the contract method.

### Period of Operation

The period of operation per season of cheese factories varied from less than six months to a full year. Factories producing 25 tons of cheese or less, averaged 6·5 months. As volume increased the period of operation was extended; in the 175 ton and over group the 9 factories averaged 11·8 months. The average period of operation for all factories was 8 months. When the factories were segregated according to months of operation it was found that one operated under six months, 90 between 6 and 9 months, 8 between 9 and 11 while 26 factories were open the year round.

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[1] In this discussion cheese makers are referred to as "hired" when they work for a salary and as "contract" when they operate the factory on a stated amount or price per pound of cheese out of which they pay operating expenses.

TABLE 14.—Average Length of Time Factories of Different Sizes are Open

| Size of factory | Number of Factories | Total Months | Average Time Open (Months) |
|---|---|---|---|
| Under 25 tons | 6 | 39·0 | 6·5 |
| 25 to 49·9 | 35 | 235·5 | 6·7 |
| 50 to 74·9 | 37 | 274·5 | 7·0 |
| 75 to 99·9 | 11 | 81·5 | 7·4 |
| 100 to 124·9 | 12 | 123·0 | 10·3 |
| 125 to 149·9 | 7 | 68·0 | 9·7 |
| 150 to 174·9 | 8 | 90·5 | 11·3 |
| 175 and over | 9 | 106·0 | 11·8 |
| Total | 125 | 1,018·0 | 8·0 |

TABLE 15.—Number of Months per Season that Factories were Operated

| Operating Period | Number of Factories | Per cent of Total |
|---|---|---|
| Under 6 months | 1 | 0·8 |
| 6— 6·9 | 33 | 26·4 |
| 7— 7·9 | 43 | 34·4 |
| 8— 8·9 | 14 | 11·2 |
| 9— 9·9 | 5 | 4·0 |
| 10—10·9 | 3 | 2·4 |
| 11—11·9 | ........ | ........ |
| 12 months | 26 | 20·8 |
| Total | 125 | 100·0 |

An Ontario Cheese Factory.

A noticeable difference occurs between the three areas in both volume of business handled and number of months factories were operated during the year.

Western Ontario factories were in operation very nearly the year round, the average figure being 11·6 months. Central and Eastern Ontario factories were only open 7·1 and 7·2 months respectively.

Similarly the average production in western factories reaches 159·8 tons per factory while the output for central and eastern factories averages 67·9 and 56·3 tons respectively. (Table 16).

TABLE 16.—Average Production and Months Operated per Year for Factories in Different Districts

| District | Number of Factories | Total Months | Average Months per Factory | Average Cheese Made per Factory | |
|---|---|---|---|---|---|
| | | | | Pounds | Tons |
| Eastern | 68 | 492 | 7·2 | 112,601 | 56·3 |
| Central | 30 | 214 | 7·1 | 135,995 | 67·9 |
| Western | 27 | 312 | 11·6 | 319,666 | 159·8 |
| All factories | 125 | 1,018 | 8·0 | 162,941 | 81·5 |

## COSTS OF MANUFACTURING CHEESE

### Method of Calculation

In the accompanying tables costs are given in detail according to two methods of calculation. Charges for hauling milk to the factory and cheese from the factory are not included.

In Method I the cost of manufacture of cheese has been figured from the viewpoint of what it cost the patron. It represents the " actual rates " charged, *i.e.*, the charges made by private owners and the set deductions patron factories make from the sale price of cheese. In addition to the actual rate charged by private factories there are also patron organization costs, salaries, milk testing and stationery that must be charged to the cheese business. Method I, then, deals with the costs as the patrons think of them. It represents, in a sense, their annual " out of pocket " expense for the year 1931, but in this case patrons have lost part of their capital by not adequately covering depreciation.

It was found on examining the costs as worked out by Method I, that all charges were not fully met. Factory owners, as a rule, did not make adequate allowance for depreciation in arriving at the rates to be charged for cheese production. Replacement costs are met when they occur but in 1931, when general retrenchment was taking place, many factories probably spent less than usual on capital items. It was found that the purchase of new equipment and expenditures on reconstruction of factories for that year amounted to a little over $10,300 for the 125 factories included in the study. This amount was about 25 per cent of the estimated depreciation charges for that year. It is probable that more would be spent on capital outlays in better times. In order, however, to apportion an equitable amount of the charges for depreciation to any one year, it was considered essential that standard charges be set up. These rates, though arbitrary in nature, would spread the costs more evenly over each year of operation instead of having wide fluctuations in replacement expenses from year to year which would be the case if the actual amounts spent on capital items by factories were taken.

In this connection, too, it will be recognized that in order to compare the efficiency of individual factories a uniform practice in dealing with fixed or capital expenditures is desirable. The rate of depreciation in different factories varies of course, but, unless taken care of by fair appraisal, must be dealt with in some standard way, for obviously the costs of operating two factories in a given year, one of which bought new equipment for replacement purposes valued at, say, $1,000, and the other no new equipment at all, cannot be compared. Over a period of twenty or thirty years, on the contrary, if records were available, the replacement costs of the two factories would represent depreciation fairly and could be compared. For the purpose of comparing the operations of a single year it was decided, therefore, to subtract all replacement items from current costs and substitute therefor a standard rate of depreciation.

Therefore, a 5 per cent rate of depreciation was charged on the present value of frame buildings and a 3 per cent rate on brick or stone structures. Depreciation on equipment was figured on the " years future use basis." Present values and years future use of the major items of equipment were obtained. Dividing the years into the value gave the depreciation figure for the year in which the study was made. Interest on invested capital was charged at 5 per cent.

In the handling of the whey product costs it was agreed to include that portion of the recipts received by the maker as a charge to the factory business. To offset this charge, and thus arrive at the cost of manufacturing cheese, the remaining portion of the receipts (the amount received by the patrons) was deducted from the total expense. The net expense thus obtained was divided by the pounds of cheese manufactured in order to obtain the cost per pound.

### COST OF OPERATION BASED ON CASH CHARGES TO PATRONS

The costs of operation based on cash charges to patrons as described under Method I are presented in table 17. Factories were classified according to the tons of cheese produced. Those in the smallest group, producing under 25 tons, had an average of 2·34 cents per pound and an average expense of $1,020.68. The rate per pound decreased considerably in the next size group and then rose slightly in the 50 and 75 tons classes. A large reduction from 2·12 cents to 1·87 cents occurred between the 75 and 100 ton groups, and a further drop of ·09 cents took place in the next class. Rates or costs then remained stable up to the highest producing group when a slight reduction of ·03 cents occurred making the average for that group 1·75 cents per pound. In all a decrease in average cost of production of 0·59 cents per pound occurred between the lowest and highest groups. The average cost based on actual rates was 1·94 cents. The average rate in patron factories was 2·02 which was slightly higher than that of private concerns. In patron plants the charges were somewhat higher in the smaller sized factories whereas in the larger units the average rates were lower than in private factories.

TABLE 17.—Cost of Operation Based on Rates Charged Patrons

| Size of Factory (tons of cheese) | Private Factories | | | Patron Factories | | | Total Factories | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number | Average Expenses | Rate per Lb. | Number | Average Expenses | Rate per Lb. | Number | Average Expenses | Rate per Lb. |
| | | $ | c. | | $ | c. | | $ | c. |
| Under 25 | 2 | 1,056·90 | 2·33 | 2 | 984·46 | 2·35 | 4 | 1,020·68 | 2·34 |
| 25— 49·9 | 21 | 1,525·17 | 2·08 | 8 | 1,493·74 | 2·13 | 29 | 1,516·50 | 2·09 |
| 50— 74·9 | 19 | 2,533·11 | 2·11 | 6 | 2,528·79 | 2·20 | 25 | 2,532·07 | 2·13 |
| 75— 99·9 | 3 | 3,358·73 | 1·90 | 5 | 3,789·80 | 2·26 | 8 | 3,628·15 | 2·12 |
| 100—124·9 | 4 | 4,599·99 | 1·88 | 2 | 3,854·30 | 1·82 | 6 | 4,351·43 | 1·87 |
| 125—149·9 | 4 | 4,760·59 | 1·80 | 1 | 4,234·59 | 1·69 | 5 | 4,655·39 | 1·78 |
| 150—174·9 | 7 | 5,615·54 | 1·78 | ...... | ............ | ...... | 7 | 5,615·54 | 1·78 |
| 175 and over | 4 | 7,205·15 | 1·76 | 2 | 8,473·62 | 1·75 | 6 | 7,627·98 | 1·75 |
| Total | 64 | 3,092·49 | 1·92 | 26 | 2,958·88 | 2·02 | 90[1] | 3,053·92 | 1·94 |

[1] In the case of 35 factories used in other tabulations rates were either not available or were not used in reporting charges to patrons.

In table 18 the cost of operation including interest and depreciation at established rates are given according to Method II. For both patron and private concerns the costs listed in this table fell into three categories: 1. The actual cash operating charges (excluding any capital expense and operator's wages) were on exactly the same basis for both types of factories. 2. Interest and depreciation charges were calculated the same way in all cases. 3. The salaries for makers were arrived at by deducting their expenses from the amounts they received for making cheese.

When all charges were represented costs for all private factories averaged 2·13 cents and for patron factories 2·18 cents. Rates in patron factories tended to be slightly higher in practically all size groups though the difference in many cases was not great.

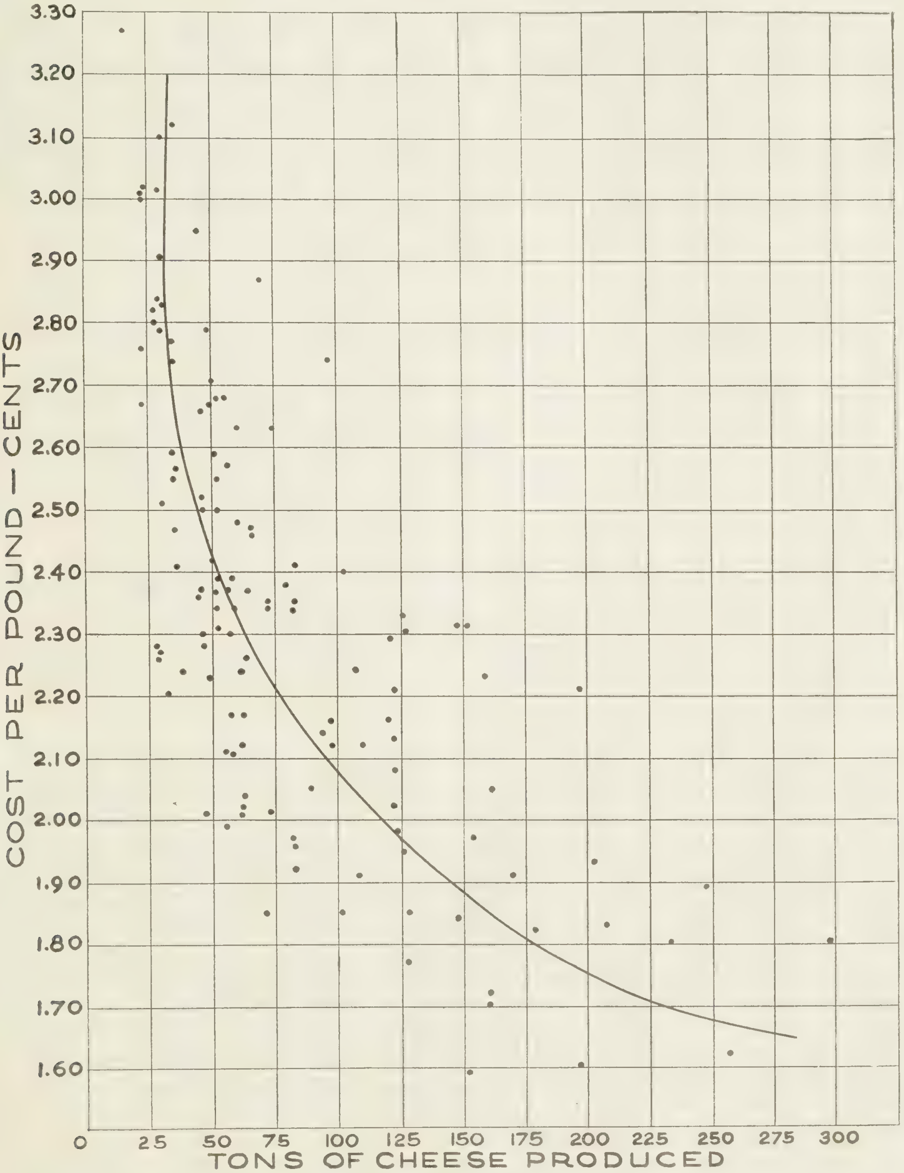


Figure 3.—Effect of Volume on Cost of Cheese Manufacture.

### DIFFERENCE BETWEEN ACTUAL RATES CHARGED AND COST OF OPERATION INCLUDING FULL CHARGES

In comparing the actual rates charged to patrons and the total costs worked out by accounting methods it was found that in the average factory the actual rate was 1·94 while when all costs were figured the rate was 2·16, a difference of ·22 cents per pound (table 19). The difference was found to be very much greater in the factories of the two smallest producing groups indicating that in smaller factories depreciation and interest were not being fully met even though a higher rate was being charged than in the larger units. The spread between the costs rapidly diminished with each increase in volume of production until at the 75-99·9 ton group it was but ·02 cents. For the 100-124·9 ton class the spread fell back to ·25 again and for the next two classes there was a slight decrease of ·03 and ·02 cents respectively. In the highest production group however a large reduction occurred, the spread becoming ·07 cents. Though actual charges fell very much short of covering full costs in small concerns yet the spread narrowed rapidly until at the 100-ton class it was at a minimum. An increase then occurred to a former level and then slight recessions took place until the final group, when again actual and full charges were practically the same.

TABLE 18.—Cost of Operation Including Interest and Depreciation at Established Rates

| Size of Factory (tons of cheese) | Privately Owned Factories | | | Patron Owned Factories | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Number of Factories | Average Cost | Cost per Pound | Number of Factories | Average Cost | Cost per Pound | Number of Factories | Cost per Pound |
| | | $ | c. | | $ | c. | | c. |
| Under 25 | 2 | 1,287·18 | 2·84 | 4 | 1,368·82 | 3·06 | 6 | 2·98 |
| 25— 49·9 | 21 | 1,873·40 | 2·56 | 14 | 1,911·33 | 2·62 | 35 | 2·58 |
| 50— 74·9 | 19 | 2,734·48 | 2·28 | 18 | 2,984·32 | 2·45 | 37 | 2·36 |
| 75— 99·9 | 3 | 3,869·13 | 2·17 | 8 | 3,657·12 | 2·13 | 11 | 2·14 |
| 100—124·9 | 4 | 5,171·81 | 2·12 | 8 | 4,764·89 | 2·12 | 12 | 2·12 |
| 125—149·9 | 4 | 5,232·66 | 1·97 | 3 | 5,143·62 | 2·04 | 7 | 2·00 |
| 150—174·9 | 7 | 6,213·84 | 1·96 | 1 | 6,460·23 | 1·91 | 8 | 1·97 |
| 175 and over | 4 | 7,361·13 | 1·80 | 5 | 8,773·03 | 1·84 | 9 | 1·82 |
| Total | 64 | 3,436·47 | 2·13 | 61 | 3,591·54 | 2·18 | 125 | 2·16 |

## Effect of Volume on costs of manufacture

An explanation for the trends in cost discussed in the preceding chapter may be found in examining the costs as presented by the two methods separately. Both the actual rates and the rates including full charges declined noticeably with every increase in volume. Apart from the smallest group of factories which had a charge of 2·34, the actual rate was around 2⅛ cents per pound for factories producing under 100 tons. A large reduction in actual rates charged then occurred from the 75 and 100-ton group and then a smaller one to the next largest unit and from there on average rates remained approximately the same. When full interest and depreciation charges were added to the factories producing under 100 tons, it was found that total charges in the first three size groups of factories were very much above those of actual, and practically the same for the 75 to 99·9-ton group. Thus, if an actual rate of 2 to 2⅛ cents is to be charged, total costs are only met when a 75-ton production or more is reached. Similarly, if 1·75 to 1·87 is to be charged all expenses can only be met by producing over 175 tons.

When full charges are met it can be seen that a difference of 1·16 cents occurs between the lowest and highest producing units. Efficiency in cost of producing cheese is thus clearly linked up with volume of production.

TABLE 19.—Effect of Volume on Cost of Cheese Manufacture

| Size of Factory (tons of cheese) | Method I. Actual Rates Charged | | Method II. Cost of Operation Including Interest and Depreciation | | Difference Between Two Methods |
|---|---|---|---|---|---|
| | Number of Factories | Cost per Pound | Number of Factories | Cost per Pound | |
| | | c. | | c. | c. |
| Under 25 | 4 | 2·34 | 6 | 2·98 | ·64 |
| 25— 49·9 | 29 | 2·09 | 35 | 2·58 | ·49 |
| 50— 74·9 | 25 | 2·13 | 37 | 2·36 | ·23 |
| 75— 99·9 | 8 | 2·12 | 11 | 2·14 | ·02 |
| 100—124·9 | 6 | 1·87 | 12 | 2·12 | ·25 |
| 125—149·9 | 5 | 1·78 | 7 | 2·00 | ·22 |
| 150—174·9 | 7 | 1·78 | 8 | 1·96 | ·18 |
| 175 and over | 6 | 1·75 | 9 | 1·82 | ·07 |
| All factories | 90 | 1·94 | 125 | 2·16 | ·22 |

## COSTS IN DETAIL

The costs presented in table 19 are given in considerably more detail in table 20. (See also fig. 4.) Here the effect of volume on various items of expense is clearly shown. The cost per pound attributable to boxes, supplies and fuel did not decrease appreciably with increase in size of factory for reasons more or less obvious. However, in the larger factories there was a decided reduction per pound when so-called fixed charges—taxes, insurance, interest and depreciation—are considered. Although hired labour costs (other than maker) increased with volume of production the amount paid to cheese makers, when computed on a per pound basis, decreased rapidly with increases in volume of production. Larger concerns were thus much more efficient in the use of the largest expense item in factory costs.

TABLE 20.—Cost per Pound of Cheese of Main Items of Expense by Size of Factory

| Main Items Of Expense | Size of Factory (tons) | | | | | | | | All Factories |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | |
| | (Cents per Pound Cheese) | | | | | | | | |
| Boxes | ·297 | ·286 | ·287 | ·270 | ·345 | ·312 | ·315 | ·321 | ·306 |
| Supplies | ·304 | ·304 | ·268 | ·280 | ·255 | ·223 | ·274 | ·248 | ·265 |
| Fuel | ·310 | ·211 | ·241 | ·235 | ·255 | ·255 | ·273 | ·235 | ·248 |
| Taxes and insurance | ·093 | ·103 | ·089 | ·083 | ·064 | ·062 | ·054 | ·051 | ·072 |
| Organization salaries | ·147 | ·082 | ·083 | ·084 | ·055 | ·062 | ·042 | ·063 | ·069 |
| Hired labour and board | ·001 | ·113 | ·188 | ·190 | ·374 | ·350 | ·382 | ·397 | ·281 |
| Maker's salary | 1·245 | ·974 | ·810 | ·678 | ·522 | ·489 | ·405 | ·414 | ·628 |
| Other factory expenses | ·048 | ·041 | ·038 | ·038 | ·039 | ·038 | ·032 | ·041 | ·039 |
| Repairs | ·073 | ·088 | ·083 | ·086 | ·127 | ·073 | ·060 | ·077 | ·080 |
| Interest | ·187 | ·180 | ·167 | ·157 | ·137 | ·148 | ·148 | ·086 | ·144 |
| Depreciation | ·305 | ·286 | ·252 | ·271 | ·218 | ·212 | ·193 | ·125 | ·218 |
| Gross expenses | 3·010 | 2·665 | 2·505 | 2·374 | 2·392 | 2·223 | 2·184 | 2·055 | 2·349 |
| Whey credit | ·030 | ·088 | ·143 | ·229 | ·271 | ·224 | ·219 | ·231 | ·194 |
| Net expense | 2·98 | 2·58 | 2·36 | 2·14 | 2·12 | 2·00 | 1·96 | 1·82 | 2·16 |
| Number of factories | 6 | 35 | 37 | 11 | 12 | 7 | 8 | 9 | 125 |

## RANGE IN COSTS OF MANUFACTURE

In table 21 costs are presented in a little different way. Here the factories are arranged in groups according to costs of operation and it will be observed that the extremes are 1·59 cents per pound in one factory and 3·27 cents per pound in another. This difference was almost entirely due to differences in volume of business handled. About 50 per cent of the factories were within the group represented by costs ranging from 2 cents to 2·50 cents per pound. The difference in costs between the highest and lowest was 1·68 cents per pound which, converted to a milk basis, would represent about 16 cents per hundred pounds, or about twenty per cent increase over prices paid during the year in question.

### Costs of Manuafcture by Districts

The cost of manufacturing cheese in the three districts of Ontario was influenced greatly by the volume of cheese produced. Factories in Eastern Ontario produced approximately 56 tons of cheese per factory at an actual cash charge to the patrons of 2·07 cents per pound. Central Ontario with an average production of 67·99 tons per factory had an actual cash charge of 2·03 cents per pound while Western Ontario factories, with an average output of slightly over 150 tons of cheese, showed an average charge of 1·76 cents per pound to patrons.

TABLE 21.—Range of Costs per Pound for Manufacturing Cheese[1]

| Costs (cents per pound) | Number In Class | Weighted Average for each Class | Percentage Dis-tribution |
|---|---|---|---|
| Under 1·60 | 1 | 1·59 | ·8 |
| 1·60—1·74 | 4 | 1·65 | 3·2 |
| 1·75—1·99 | 19 | 1·87 | 15·2 |
| 2·00—2·24 | 29 | 2·13 | 23·2 |
| 2·25—2·49 | 34 | 2·35 | 27·2 |
| 2·50—2·74 | 19 | 2·61 | 15·2 |
| 2·75—2·99 | 11 | 2·85 | 8·8 |
| 3·00—3·24 | 7 | 3·11 | 5·6 |
| 3·25 and over | 1 | 3·27 | ·8 |
| Total or average | 125 | 2·16 | 100·0 |

[1] These costs include full depreciation and interest charges.

When all costs were fully taken into account it was found that the cost of cheese production in Eastern and Central Ontario averaged 2·27 cents per pound while the figure for Western Ontario was 2 cents per pound.

TABLE 22.—Cost of Manufacturing Cheese (cents per pound) in Different Districts

| District | Average Volume per Factory | Actual Cash Charges Method I | | Total Charges Method II | |
|---|---|---|---|---|---|
| | Pounds Cheese | Number of Factories | Rate | Number of Factories | Rate |
| | | | cts. | | cts. |
| Eastern | 112,601 | 59 | 2·07 | 68 | 2·27 |
| Central | 135,995 | 14 | 2·03 | 30 | 2·27 |
| Western | 319,666 | 17 | 1·76 | 27 | 2·00 |
| Total or average | 162,941 | 90[1] | 1·94 | 125 | 2·16 |

[1] See note table 17.

## CONTRACT RATES AND AMOUNTS RECEIVED BY CHEESE MAKERS

Because of the relationship existing between cheesemakers and patrons the salary, or amount in lieu thereof, received by makers and owners is frequently the subject of considerable discussion. The fact that it represents the major item of expense tends to further emphasize its importance.

The amount received by makers and owners is based upon the volume of cheese produced but there are additional sources of income which should be mentioned. A comparison of these rates and amounts received will aid both patron and maker in reaching a decision on the rate or basis of contract suited to a particular factory. Receipts from whey cream make up the major portion of the supplementary income while the value of house rental supplied and payments for skimming whole milk compose the rest. (For rates received for whey cream manufacture see table 30.) The net return to operator's labour and management was ascertained by subtracting all expenses from his total receipts.

All makers were paid on a per pound cheese basis except for those engaged on a " hired " basis and these were either paid a set wage per month or a rate per pound. As already intimated makers fell into three classes—owner, contract and hired. The rate paid to owner makers should cover all supplies, labour, upkeep of plant and equipment and a wage for management as well as interest. Contract makers were obliged to furnish supplies and pay labour out of the rate they received while " hired " makers only furnished the extra labour required.

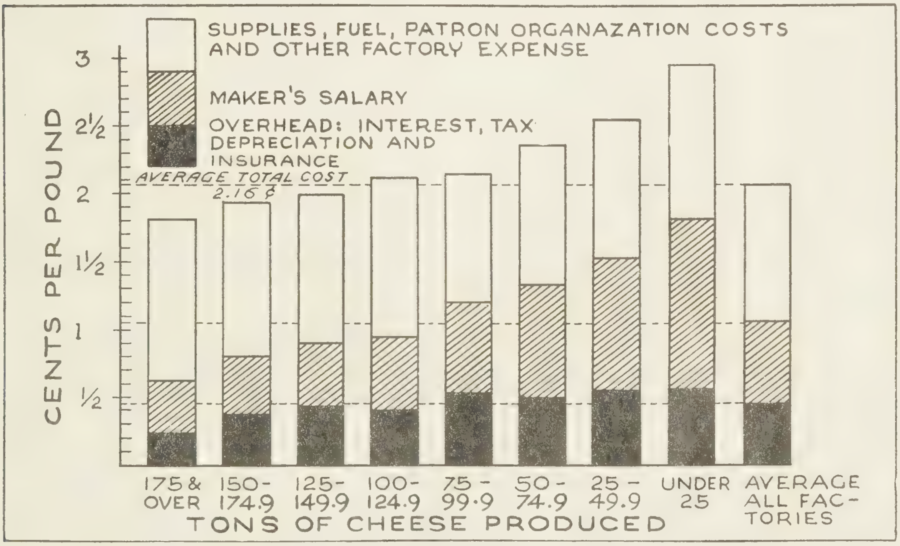


Figure 4.—Influence of Volume of Production on Various Items of Expense.

### Owner Makers

The rates paid private owner makers ranged from $1.40 to $2.25 per hundredweight of cheese and varied according to the size of the factory. In factories producing under 25 tons of cheese $2\frac{1}{8}$ to $2\frac{1}{4}$ cents per pound was charged by the maker. From 25 ton to 49·9 ton factories $1\frac{3}{4}$ to $2\frac{1}{6}$ cents was charged, the most common figure being 2 cents per pound. In the next size group, 50 to 74·9 tons, 2 cents was also the most common rate. From $1\frac{3}{4}$ to 2 cents was charged in 75 to 99·9 tons factories. In factories producing over 100 ton of cheese the rates paid makers varied from $1.40 to $2 per hundredweight of cheese, the most common charges being $1.40 and $1.70 (table 23).

Receipts from cheese manufacture to owners who operated their plants, before deducting expenses, varied from $992 in factories producing under 25 tons to $6,479 in factories making over 175 tons of cheese. Receipts from whey cream increased as factories increased in size. The range from lowest to highest, being the average for the extreme sizes of factories, was $68 to $978. The main item included under " other receipts " was for skimming milk. For the 56 factories cheese receipts averaged $2,932, whey cream $256 and other receipts $18 making the average receipts to owner makers $3,206. Total receipts on a per pound cheese basis ranged from 2·19 to 1·78 cents from the lowest to the highest producing group and averaged 1·98 cents per factory (table 24).

TABLE 23.—Rates per Pound Paid Private Owner Makers by Size of Factory

| Rates Paid per Pound | Size of Factory (tons) | | | | | | | | All Factories | Per Cent in Each Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | | |
| cts. | | | | | | | | | | |
| 2·25 | 1 | | 1 | | | | | | 2 | 3·57 |
| 2·125 | 1 | 5 | 2 | | | | | | 8 | 14·29 |
| 2·00 | | 10 | 10 | 1 | | | 1 | | 22 | 39·29 |
| 1·90 | | 1 | 1 | | 1 | 1 | 1 | | 5 | 8·93 |
| 1·875 | | 1 | | | | | | | 1 | 1·79 |
| 1·85 | | 1 | | | | | | | 1 | 1·79 |
| 1·75 | | 1 | 1 | 2 | | | | | 4 | 7·14 |
| 1·70 | | | | | 1 | | | | 1 | 1·79 |
| 1·65 | | | | | 1 | | 1 | | 2 | 3·57 |
| 1·60 | | | | | | 1 | 2 | 2 | 5 | 8·93 |
| 1·55 | | | | | | | 2 | | 2 | 3·57 |
| 1·50 | | | | | | | | 1 | 1 | 1·79 |
| 1·40 | | | | | | 1 | | 1 | 2 | 3·57 |
| Total | 2 | 19 | 15 | 3 | 3 | 3 | 7 | 4 | 56 | 100· |
| Per cent in Each Group | 3·57 | 33·93 | 26·79 | 5·36 | 5·36 | 5·36 | 12·50 | 7·14 | 100 | |

NOTE:—Owner makers pay all factory expenses, except those of the patron organization, out of rates received.

These receipts, however, were balanced by expenses which increased markedly as the volume of output became larger. Extra labour and board rose from $115 as an average for the 25 to 49·9 ton group to $1,885 for the largest sized factories. The average for all factories was $497. Supplies and fuel expense increased from $436 to $3,403 and averaged $1,401 for all factories. Repairs to buildings and equipment increased also and averaged $119. Other expenses averaged $5 per factory. Total cash expenses, comprising all the above items, varied from $436 to $5,568 from the lowest to the highest production groups of factories. Subtracting the cash expenses from receipts it can be seen that the net return to operators' or makers' labour and capital averaged $556 for the smallest group and $1,889 for the largest group of factories. However, interest and depreciation charges showed a remarkable increase as the size of business increased and when these amounts were deducted it was found that the average return to the operators' labour for all factories was $599. The average return from smallest to largest group ranged from $330 to $1,106 for the year. On a per pound basis, however, returns to labour showed a marked tendency to decrease, the range from lowest to highest being ·73 to ·26 cent per pound.

The average return for owner operators' labour for all factories was ·37 cent per pound of cheese. Labour efficiency increased remarkably as the volume of production became greater (table 24).

## Contract Makers

The rates paid to contract makers varied from $0.71 per hundredweight of cheese in a factory producing over 175 tons to $2.15 in a factory making between 50 and 75 tons of cheese. Even though contract makers furnished supplies and extra labour yet the rates received rapidly declined as the volume of business increased. In factories producing up to 74·9 tons of cheese, the rates varied from $1\frac{1}{2}$ to $2\frac{1}{8}$ cents per pound, the most common rate being $1\frac{7}{10}$ cent per pound or 17 mills. From 75 to 124·9 tons the rates ranged from $1.35 to $1.55 per hundredweight of cheese and from 125 to over 175 tons the range was greater, being $0.71 to $1·625, while the average was approximately $1.55 per hundredweight (table 25).

TABLE 24.—Average Receipts, Expenses and Net Returns to Private Owner Makers

| — | Size of Factory (tons of cheese) | | | | | | | | Total or Average |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | |
| Number of Factories.... | 2 | 19 | 15 | 3 | 3 | 4 | 7 | 3 | 56 |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Average receipts from: | | | | | | | | | |
| Cheese making....... | 992 | 1,489 | 2,417 | 3,248 | 4,452 | 4,297 | 5,422 | 6,479 | 2,932 |
| Whey product........ | ........ | 68 | 93 | 196 | 526 | 63 | 594 | 978 | 256 |
| Other sources......... | ........ | ........ | ........ | ........ | ........ | 110 | 78 | ........ | 18 |
| Total................. | 992 | 1,557 | 2,510 | 3,444 | 4,978 | 5,010 | 6,094 | 7,457 | 3,206 |
| Expenses per factory:— | | | | | | | | | |
| Labour and board.... | ........ | 115 | 240 | 466 | 897 | 951 | 1,216 | 1,885 | 497 |
| Supplies and fuel...... | 436 | 670 | 1,032 | 1,474 | 2,239 | 2,040 | 2,838 | 3,403 | 1,401 |
| Repairs.............. | ........ | 66 | 82 | 164 | 203 | 210 | 196 | 280 | 119 |
| Other................ | ........ | 1 | 2 | ........ | ........ | 61 | ........ | ........ | 5 |
| Total cash operating.. | 436 | 852 | 1,356 | 2,104 | 3,339 | 3,262 | 4,250 | 5,568 | 2,022 |
| Net return capital and operator's labour..... | 556 | 705 | 1,154 | 1,340 | 1,639 | 1,748 | 1,844 | 1,889 | 1,184 |
| Depreciation and interest............... | 226 | 378 | 453 | 645 | 865 | 950 | 1,095 | 783 | 585 |
| Return to operator's labour................. | 330 | 327 | 701 | 695 | 774 | 798 | 749 | 1,106 | 599 |
| Per pound of cheese— | | | | | | | | | |
| Receipts (cts.)........ | 2·19 | 2·09 | 2·13 | 1·95 | 2·05 | 1·89 | 1·93 | 1·78 | 1·98 |
| Labour return (cts.)... | ·73 | ·44 | ·60 | ·39 | ·32 | ·30 | ·24 | ·26 | ·37 |

TABLE 25.—Rate per Pound of Cheese Paid to Contract Makers in Different Sized Factories

| Rate Received per Pound of Cheese | Size of Factory (tons of cheese) | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | |
| 2·15 | | | 1 | | | | | | 1 |
| 2·0 | 1 | | | | | | | | 1 |
| 1·90 | | 1 | | | | | | | 1 |
| 1·80 | | 1 | | | | | | | 1 |
| 1·70 | | 2 | 4 | | | | | | 1 |
| 1·625 | | | | | | 1 | | | 6 |
| 1·60 | | 1 | 3 | | | | | 1 | 5 |
| 1·55 | | | 1 | | 2 | | | | 3 |
| 1·50 | | | 1 | 1 | 1 | | | 1 | 4 |
| 1·45 | | | | | 2 | | 1 | | 3 |
| 1·35 | | | | | 1 | | | | 1 |
| 1·30 | | | | | | | | 1 | 1 |
| 1·25 | | | | | | 1 | | | 1 |
| 1·05 | | | | | | | | 1 | 1 |
| ·71 | | | | | | | | 1 | 1 |
| Total | 1 | 5 | 10 | 1 | 6 | 2 | 1 | 5 | 31 |

Note.—Contract makers bear cost for hired labour, supplies and fuel out of rates received.

Receipts from cheese, whey product and house rent increased rapidly as the volume of business increased as seen in table 26. The rent of the house supplied is an arbitrary figure based on the value of the house and has been taken as part of the contract maker's income.

Total receipts ranged from $1,095 to $7,044 from the smallest to the highest producing group of factories. Expressed as a rate per pound of cheese however, they declined from 2·23 to 1·48 cents. The average return to all contract makers was $3,613 or 1·72 cents per pound of cheese. Receipts from cheese made up 1·45 cents, whey ·21, rental value of house supplied ·03, and other receipts ·03 cent per pound.

Contract makers had to furnish supplies and fuel as well as extra labour and board. These expenses naturally increased as the volume of business became larger. Total expenses averaged $2,360 for all factories, an average of 1·12 cents per pound. For the smallest group they were $467 and for the largest $5,124. Expenses per pound of cheese varied for factories of different sizes but tended to increase with volume of output. The return to operator's labour averaged $1,253 for all factories, an amount equal to 0·6 cent for every pound of cheese produced. Though the absolute amount due to labour increased as the factory size became larger yet there was a noticeable decrease when converted to a pound of cheese basis. The labour returns for the smallest size of factories was 1·28 cents and for the largest group 0·4 cent per pound.

## Hired Makers

Hired makers were either paid on a pound cheese basis or at a set wage per month. Of the 38 makers 15 were paid a wage and 23 were paid a rate per pound of cheese. Out of the amount received hired makers had to pay for all extra labour. In the smaller factories producing up to 50 tons of cheese, wages to maker ranged from $125 to $70 per month, the majority of makers getting $80 to $100 per month. In factories over 100 tons the wages received were higher, being $145 to $205 per month. In these factories considerable sums would have to be paid out for extra labour. Rates per pound of cheese varied from 60 to 85 cents per hundredweight (table 27).

In most factories the only expense which hired makers had to meet was extra labour and board. In a few factories, however, they had small miscellaneous expenses such as telephone and stationery. The receipts for cheese-

TABLE 26.—Average Receipts, Expenses and Net Returns to Contract Makers

| — | Size of Factory (tons of cheese) | | | | | | | | Total or Average |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—179·4 | 175 and Over | |
| Number of Factories | 1 | 5 | 10 | 1 | 6 | 2 | 1 | 5 | 31 |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Average receipts from— | | | | | | | | | |
| Cheese making | 983 | 1,419 | 2,196 | 2,469 | 3,389 | 3,668 | 4,946 | 5,875 | 3,048 |
| Whey product | 102 | 162 | 279 | 496 | 442 | 472 | 524 | 1,056 | 439 |
| Rental, house supplied | 10 | 29 | 61 | 64 | 96 | 85 | 200 | 93 | 72 |
| Other | ........ | ........ | ........ | ........ | 241 | 63 | ........ | 20 | 54 |
| Total | 1,095 | 1,610 | 2,536 | 3,029 | 4,168 | 4,288 | 5,670 | 7,044 | 3,613 |
| Expenses per factory— | | | | | | | | | |
| Labour and board | 18 | 105 | 333 | 456 | 1,001 | 912 | 1,225 | 1,896 | 737 |
| Supplies and fuel | 415 | 575 | 1,028 | 1,107 | 1,975 | 2,044 | 3,539 | 3,228 | 1,622 |
| Other | 34 | ........ | ........ | ........ | ........ | ........ | ........ | ........ | 1 |
| Total | 467 | 680 | 1,361 | 1,563 | 2,976 | 2,956 | 4,764 | 5,124 | 2,360 |
| Net returns to operator's Labour and Management | 628 | 930 | 1,175 | 1,466 | 1,192 | 1,332 | 906 | 1,920 | 1,253 |
| Per pound of Cheese— | | | | | | | | | |
| Maker's receipts (cts.) | 2·23 | 1·98 | 1·95 | 1·84 | 1·82 | 1·71 | 1·92 | 1·48 | 1·72 |
| Maker's expenses (cts..) | ·95 | ·84 | 1·05 | ·95 | 1·30 | 1·18 | 1·61 | 1·08 | 1·12 |
| Return to Labour (cts.) | 1·28 | 1·14 | ·90 | ·89 | ·52 | ·53 | ·31 | ·40 | ·60 |

making, therefore, were necessarily lower than in the case of contract or owner makers. These receipts averaged $855 per factory and increased with the size of business operated. Whey cream brought in an average of $117 per maker. As the output of cheese increased average payments of whey cream receipts to makers rose from $29 to $489. Many hired makers were supplied with a house and an average of $41 per maker was added to the salaries received to cover this item. Total receipts increased from $539 to $2,200 from the smallest to the largest factories. Expenses, chiefly extra labour, rose from an average of $1 to $690 in these two groups. The net returns to operators' labour averaged $862 per factory. Makers in factories producing under 25 tons received an average of $537; the amounts increased with the output of cheese and in the factories making over 175 tons, an average of $1,510 was received. The return per pound of cheese to hired makers varied in the different sized factories but tended to decrease with every increase in volume of cheese. The average labour return to hired makers for all factories was ·69 cent per pound (table 28).

## FACTORIES SEPARATING WHEY

About one-quarter of a pound of butter can be manufactured from the butterfat separated from 100 pounds of whey. Many factories in Ontario have installed whey separators to skim the whey and some also have butter making equipment to manufacture the cream obtained into butter. The extra room required, extra labour, fuel, separator, tanks, churns, piping, etc., amount to a considerable sum so only those factories having sufficient volume of business can expect to make a profit on their whey cream or butter manufacture.

TABLE 27.—Wages and Rates Paid to Hired Makers in Private and Patron Factories by Size of Factory

| Rates Paid (dollars per month) | Size of Factory (tons) | | | | | | | | Total Number of Factories |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | |
| 70— 79 | | 1 | | | | | | | 1 |
| 80— 89 | 2 | 3 | | | | | | | 5 |
| 90— 99 | 1 | 1 | | | | | | | 2 |
| 100—109 | | 1 | | | | | | | 1 |
| 110—119 | | 1 | | | | | | | 1 |
| 125 | | 1 | | | | | | | 1 |
| 145 | | | | | 1 | | | | 1 |
| 162·50 | | | | | 1 | | | | 1 |
| 165 | | | | | 1 | | | | 1 |
| 205 | | | | | | | | 1 | 1 |
| Sub-total | 3 | 8 | | | 3 | | | 1 | 15 |
| Cents per Lb. | | | | | | | | | |
| ·85 | | 1 | | | 1 | | | | 2 |
| ·80 | | | 1 | | | | | | 1 |
| ·75 | | 1 | 1 | | | | | | 2 |
| ·725 | | | | 1 | | | | | 1 |
| ·72 | | | 1 | | | | | | 1 |
| ·70 | | 1 | 4 | 1 | 1 | | | | 7 |
| ·60 | | | 5 | | 1 | | | | 6 |
| ·55 | | | | 1 | | 1 | | | 2 |
| ·50 | | | | 1 | | | | | 1 |
| Sub-total | | 3 | 12 | 4 | 3 | 1 | | | 23 |
| Grand total | 3 | 11 | 12 | 4 | 6 | 1 | | 1 | 38 |

NOTE.—Hired makers have to pay all extra labour out of rates received.

TABLE 28.—Average Receipts, Expenses and Net Returns to Hired Makers

| — | Size of Factory (tons of cheese) | | | | | | | | Total or Average |
|---|---|---|---|---|---|---|---|---|---|
| | Under 25 | 25—49·9 | 50—74·9 | 75—99·9 | 100—124·9 | 125—149·9 | 150—174·9 | 175 and Over | |
| Number of Factories | 3 | 11 | 12 | 7 | 3 | 1 | | 1 | 38 |
| | $ | $ | $ | $ | $ | $ | $ | $ | $ |
| Average receipts from— | | | | | | | | | |
| Making cheese | 522 | 594 | 774 | 1,124 | 1,268 | 1,401 | | 2,050 | 855 |
| Whey product | | 29 | 118 | 214 | 238 | 489 | | | 117 |
| Rental, house supplied | 17 | 15 | 60 | 44 | 53 | | | 150 | 41 |
| Other | | | 3 | | | | | | 1 |
| Total | 539 | 638 | 955 | 1,382 | 1,559 | 1,890 | | 2,200 | 1,014 |
| Expenses per factory— | | | | | | | | | |
| Labour and board | 1 | 14 | 121 | 251 | 317 | 741 | | 690 | 151 |
| Other | | | 1 | | 7 | | | | 1 |
| Total | 1 | 14 | 122 | 251 | 324 | 741 | | 690 | 152 |
| Net return to operator's Labour and management | 538 | 624 | 833 | 1,131 | 1,235 | 1,149 | | 1,510 | 862 |
| Per pound of cheese— | | | | | | | | | |
| Maker's receipts (cts.) | ·54 | ·94 | ·83 | ·80 | ·70 | ·74 | | ·57 | ·81 |
| Maker's expenses (cts.) | | ·02 | ·10 | ·15 | ·15 | ·29 | | ·18 | ·12 |
| Net returns to labour (cts) | ·54 | ·92 | ·73 | ·65 | ·55 | ·45 | | ·39 | ·69 |

In 84 factories out of the 125 included in the survey whey cream or butter manufacturing equipment had been installed. Only when the factory output reached 75 tons had the practice become general as but 28 of the 78 factories making under 75 tons had installed equipment (table 29).

It is interesting to note that a larger proportion of patron owned factories were making the whey product. In the 42 privately owned factories with under 75 tons output, only 14 manufactured whey cream or butter whereas the practice was carried on in 24 out of 36 patron factories in the same size groups. The high initial cost of installing the equipment can be more easily borne by a large number of patron owners than by an individual owner of a factory.

TABLE 29.—Division of Factories According to Ownership and Number of Each Type Separating Whey

| Size of Factory (tons of cheese) | All Factories | | Private Factories | | Patron Factories | |
|---|---|---|---|---|---|---|
| | Total | Number Separating Whey | Total | Number Separating Whey | Total | Number Separating Whey |
| Under 25 | 6 | 1 | 2 | ........... | 4 | 1 |
| 25— 49·9 | 35 | 13 | 21 | 5 | 14 | 8 |
| 50— 74·9 | 37 | 24 | 19 | 9 | 18 | 15 |
| 75— 99·9 | 11 | 10 | 3 | 2 | 8 | 8 |
| 100—124·9 | 12 | 12 | 4 | 4 | 8 | 8 |
| 125—149·9 | 7 | 7 | 4 | 4 | 3 | 3 |
| 150—174·9 | 8 | 8 | 7 | 7 | 1 | 1 |
| 175 and over | 9 | 9 | 4 | 4 | 5 | 5 |
| Total | 125 | 84 | 64 | 35 | 61 | 49 |

## Division of Receipts from Whey Cream

A very wide variation occurred in both the amount paid and the method of apportioning the whey cream receipts to the cheesemaker. They either received a percentage of the total receipts or a rate per pound butterfat or per pound of whey butter manufactured.

TABLE 30.—Cheese Maker's Share of Receipts from Sale of Whey Product

| Share to Maker | Number of Factories | Private | | Patrons' Factory | |
|---|---|---|---|---|---|
| | | Owner Maker | Hired Maker | Hired Maker | Contract Maker |
| No share of whey cream receipts | 5 | .......... | 2 | 2 | 1 |
| 25 per cent of value | 3 | .......... | 11 | 1 | 1 |
| 33⅓ per cent “ | 5 | 2 | .......... | 1 | 2 |
| 40 per cent “ | 1 | 1 | .......... | .......... | .......... |
| 50 per cent “ | 26 | 24 | .......... | .......... | 2 |
| 100 per cent “ | 1 | .......... | .......... | 1 | .......... |
| 3 cent butter fat | 1 | .......... | .......... | 1 | .......... |
| 4 “ “ | 1 | .......... | .......... | 1 | .......... |
| 6 “ “ | 1 | .......... | .......... | 1 | .......... |
| 8 “ “ | 15 | .......... | 1 | 4 | 10 |
| 10 “ “ | 4 | .......... | .......... | .......... | 4 |
| 12 “ “ | 1 | .......... | .......... | .......... | 1 |
| 5 “ pound butter | 2 | .......... | .......... | 2 | .......... |
| 6 “ “ | 1 | .......... | .......... | 1 | .......... |
| 7 “ “ | 3 | .......... | .......... | 3 | .......... |
| 7½ “ “ | 1 | .......... | .......... | .......... | 1 |
| 8 “ “ | 8 | 1 | .......... | 1 | 6 |
| 10 “ “ | 2 | .......... | .......... | .......... | 2 |
| 15 “ “ | 3 | 3 | .......... | .......... | .......... |
| Total | 84 | 31 | 4 | 19 | 30 |
| Factories not separating whey cream | 41 | 25 | 4 | 11 | 1 |

The majority of private owner makers received a percentage of the total value of receipts and practically all were paid one-half of the proceeds. This amount was commonly considered sufficient to pay for the extra labour, fuel and equipment involved in the manufacture of the product. Two owner makers, however, received only one-third of the value, one received 40 per cent and one retained all the receipts. The hired or contract makers paid on a percentage basis, either received one-quarter or one-third of the proceeds.

For those makers who received payment on a butterfat basis, for whey cream, the rates ranged from 3 to 12 cents per pound, the most common one being 8 cents. Rates per pound for manufacturing whey butter varied from 5 cents to 15 cents per pound. Four owner makers received 8 to 15 cents per pound which, in 1931, would be somewhat over half the value of the product. Contract makers received from 5 to 7½ cents per pound (table 30).

## YIELD OF CHEESE TO MILK AND BUTTERFAT

One of the most important influences in the volume of cheese produced per hundred pounds of milk is the butterfat content of the milk. A total of 523 monthly or semi-monthly reports on pounds of milk, pounds of fat and pounds of cheese produced are shown in table 31. Before discussing the results of this table it might be well to point out the large proportion of tests which average under 3·4 per cent. A total of 244 out of the 523 were below this figure.

The importance of high test milk is indicated in the column "Pounds of milk to make a pound of cheese". A total of 12·54 pounds of milk testing under 2·9 per cent butterfat was required to make one pound of cheese while the amount decreased rapidly as the test increased—only 9·52 pounds of milk being required when the test was 4·2 per cent. Thus a difference of 1·3 per cent in butterfat content made a difference of 3·02 pounds of milk required to make a pound of cheese. Similarly when the pounds of cheese per hundredweight of milk is worked out, the yield increases as the quality of the milk, measured in terms of butterfat, improves.

TABLE 31.—Yield of Cheese to Milk and Butterfat

| Range of Test | Number of Reports | Milk | Fat | Cheese | Pounds Milk to One Pound Cheese | Pounds Cheese | |
|---|---|---|---|---|---|---|---|
| | | | | | | to One lb. Fat | to One cwt. Milk |
| | | lbs. | lbs. | lbs. | | | |
| 2·9 and under | 24 | 4,158,216 | 121,520 | 331,508 | 12·54 | 2·728 | 7·97 |
| 3·0—3·19 | 73 | 15,571,504 | 477,673 | 1,287,402 | 12·09 | 2·695 | 8·27 |
| 3·2—3·39 | 147 | 23,612,817 | 772,734 | 1,996,449 | 11·83 | 2·584 | 8·45 |
| 3·4—3·59 | 117 | 15,051,946 | 525,135 | 1,349,676 | 11·15 | 2·570 | 8·97 |
| 3·6—3·79 | 69 | 7,245,788 | 268,595 | 688,443 | 10·52 | 2·563 | 9·50 |
| 3·8—3·99 | 44 | 3,855,341 | 148,931 | 375,883 | 10·26 | 2·524 | 9·75 |
| 4·0—4·19 | 27 | 2,039,375 | 87,685 | 220,499 | 9·25 | 2·515 | 10·81 |
| 4·2 and over | 22 | 1,274,569 | 54,277 | 133,904 | 9·52 | 2·467 | 10·50 |
| Total or average | 523 | 72,809,556 | 2,456,550 | 6,383,764 | 11·4 | 2·599 | 8·76 |

NOTE.—Average test 3·37.

## QUALITY OF CHEESE PRODUCED

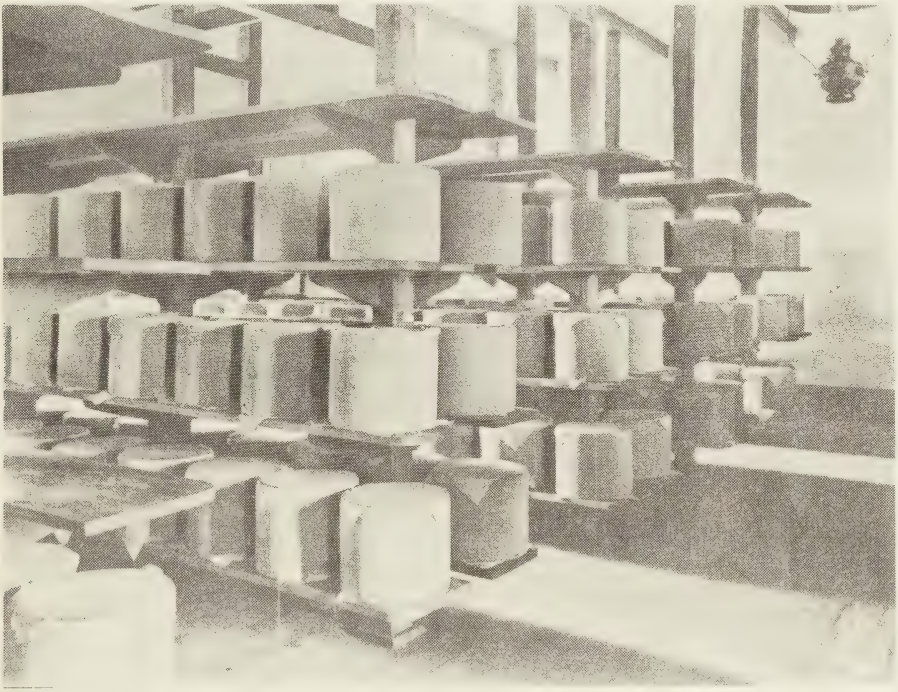
### Relation of Size of Factory to Quality of Cheese

The evidence submitted in table 32 supports the conclusion that high grade cheese can be and is produced in the province of Ontario. In the 125 factories surveyed 97 per cent of the boxes graded number one, 2·7 per cent number two, and 0·3 per cent number three. Some "no grade" cheese was produced but the amount was almost negligible in terms of the general average. The average score, which embraces all factors of quality and texture in cheese was also quite high, being 92·308.

The quality of cheese made in the small factories as evidenced by both grade and score was noticeably below that of larger plants but there was no appreciable difference in quality of product made by the medium sized and large factories.

TABLE 32.—Comparison of Grades of Cheese made in Factories of Different Sizes

| Size of Factory | Number of Factories | Average Number of Boxes | Percentage of Boxing Grading | | | | Average Score per Factory |
|---|---|---|---|---|---|---|---|
| | | | No. 1 | No. 2 | No. 3 | No grade | |
| Under 25 | 6 | 484 | 93·7 | 5·6 | 0·5 | 0·2 | 92·115 |
| 25— 49·9 | 35 | 823 | 96·5 | 3·1 | 0·4 | 0·0 | 92·310 |
| 50— 74·9 | 37 | 1,275 | 96·2 | 3·4 | 0·3 | 0·1 | 92·318 |
| 75— 99 9 | 11 | 1,883 | 94·4 | 4·9 | 0·7 | 0·0 | 92·239 |
| 100—124·9 | 12 | 2,916 | 98·2 | 1·7 | 0·1 | 0·0 | 92·387 |
| 125—149·9 | 7 | 2,570 | 95·6 | 4·0 | 0·4 | 0·0 | 92·202 |
| 150—174·9 | 8 | 3,157 | 98·1 | 1·6 | 0·3 | 0·0 | 92·389 |
| 175 and over | 9 | 5,775 | 98·2 | 1·5 | 0·3 | 0·0 | 92·381 |
| Total or average | 125 | 1,839 | 97·0 | 2·7 | 0·3 | 0·0 | 92·308 |



Interior of Cheese Factory Curing Room.

## Quality of Cheese Made in Different Areas

Although some difference occurs in the average score and percentage of first grade cheese between the factories of the eastern, central and western districts, yet these differences are not very great. In Central Ontario, a 92·490 score was obtained in comparison with 92·433 from Western Ontario and 92·178 from Eastern Ontario. Western Ontario, however, had 96·95 per cent first grade cheese while the corresponding figures for Central and Eastern Ontario were 96·76 and 94·86 respectively.

TABLE 33.—Comparison of Quality of Cheese made in Different Areas

| Area | Number of Factories | Average Number of Boxes | Percentage of Grades | | | | Score |
|---|---|---|---|---|---|---|---|
| | | | 1st | 2nd | 3rd | No grade | |
| Eastern | 68 | 1,251 | 94·86 | 4·50 | 0·59 | 0·05 | 92·178 |
| Central | 30 | 1,371 | 96·76 | 2·56 | 0·58 | 0·10 | 92·490 |
| Western | 27 | 3,839 | 98·75 | 1·23 | 0·02 | — | 92·433 |
| All factories | 125 | 1,839 | 96·95 | 2·68 | 0·33 | 0·04 | 92·308 |

# THE SALE OF CHEESE

## Method of Sale

As discussed elsewhere in this report it is customary for patrons to elect a salesman to sell the cheese. In some factories the secretary or president of the association, is selected as salesman. The patrons also determine the channels through which the cheese is to be sold. For this purpose in many districts, factories have grouped together and have been instrumental in setting up "cheese boards" to facilitate the marketing of their product. The cheese board or auction is held regularly—in most cases once a week—and is attended by the salesmen from factories holding membership in the board, and by buyers representing, for the most part, exporters located in Montreal. Some factories sell direct to buyers who travel through the districts, or even sell to firms without seeing the buyer. Others again sell through brokers, chief among which may be cited the United Dairymen Co-operative Ltd. All cheese, however, no matter through what channel it is sold, if for export, must be graded by Dominion officials and the grade indicated on the box.

Table 34 indicates the agencies through which cheese is sold and the number of factories selling each way. Over fifty per cent of the factories sold direct to a buyer. Thirty-four of the factories, or 27·2 per cent, sold through a cheese board and 21, or 16·8 per cent, sold through a broker. Many of the sales to private buyers, however, were made on the basis of the "board" price for the particular week of sale. Practically all of the factories listed as selling to a broker sold through the United Dairymen Co-operative, Ltd. This medium of sale is most popular in Central Ontario; in Eastern Ontario cheese boards receive more support than elsewhere.

TABLE 34.—Methods of Marketing Cheese

| District | Number of Factories | Medium of Sale | | |
|---|---|---|---|---|
| | | Cheese Board | Direct to Buyer(1) | Through Broker(2) |
| Eastern | 68 | 25 | 36 | 6 |
| Central | 30 | 7 | 8 | 15 |
| Western | 27 | 2 | 25 | — |
| Totals | 125 | 34 | 69 | 21 |

(1) Many factories selling direct to buyers sold on a "board price" basis.

(2) Practically all factories listed under "broker" sold through the United Dairymen Cooperative, Ltd.

## Prices Received for Cheese

The average price received for cheese for all factories was 11·13 cents per pound for 1931. Deducting cheese hauling costs the price received at the factory averaged 10·89 cents per pound. Whey cream or butter receipts averaged $588.33 per factory, which when converted to a pound of cheese basis was ·361 cent per pound of cheese. Other cheese factory receipts averaged ·046 cent per pound of cheese. Thus total receipts per pound of cheese were 11·297 cents for all factories.

The actual price received per pound of cheese, f.o.b. local shipping point was used in order to compare prices received by different factories. Whey cream or butter and other receipts were thus disregarded. Table 35 reveals that 31·7 per cent of the factories sold cheese under 11 cents per pound, 3·25 per cent sold under 10·5 cents, and only 2·44 per cent sold for 11·5 cents or over. The actual range in prices received was 10·39 to 11·57 cents, a difference of 1·18 cents per pound. The prices quoted, however, are influenced to some degree by the distance from the central market at Montreal and so the fluctuations cannot be said to be wholly due to differences in quality. An examination of prices received in the three main districts will better illustrate this point.

Table 33 showed that there was very little difference in the average quality of cheese made in the three main districts, the slight difference which did occur being in favour of central and western factories. The differences in average prices received, 11·26 for Eastern, 11·20 for Central and 10·70 cents per pound for Western Ontario, can be attributed in most instances to the distance from the central market at Montreal.

Within each district, however, the factor of distance from market should be minimized and that of quality should exert a greater effect upon the price received. In each district it can be seen that the prices received vary considerably, which fact suggests that cheese of different quality is being produced.

TABLE 35.—Prices Received for Cheese, Including Averages and Range for Different Areas

| Average price received per pound | Number of Factories | | | Number of Factories | Per cent in each Group |
|---|---|---|---|---|---|
| | Eastern | Central | Western | | |
| Under 10·5 | 2 | — | 2 | 4 | 3·25 |
| 10·5 —10·74 | — | — | 15 | 15 | 12·19 |
| 10·75—10·99 | 9 | 3 | 8 | 20 | 16·26 |
| 11·0 —11·24 | 23 | 12 | 1 | 36 | 29·26 |
| 11·25—11·49 | 31 | 14 | — | 45 | 36·58 |
| 11·5 and over | 2 | 1 | — | 3 | 2·44 |
| Totals | 67 | 30 | 26 | 123 | 100· |
| Highest | 11·57 | 11·52 | 11·00 | 11·57 | — |
| Lowest | 10·40 | 10·88 | 10·39 | 10·39 | — |
| Average* | 11·26 | 11·20 | 10·70 | 11·13 | — |

*Simple averages.

The data in table 36 was compiled in order to compare prices received for cheese in the three areas for the summer months, thus excluding "fodder" cheese which usually sells for a lower price than "grass" cheese. Average prices received per pound in the six month period for the three areas were: Eastern, 11·34; Central, 11·41, and Western Ontario, 10·75. It will be noted that these prices are slightly higher than those given in table 35, and also that the average for Central Ontario is somewhat higher than that for the Eastern section.

TABLE 36.—Monthly Average Prices received for Cheese in the Different Areas

| Month | Average Price per Pound in Cents | | | |
|---|---|---|---|---|
| | Eastern | Central | Western | All Ontario |
| May | 10·30 | 10·52 | 9·76 | 10·13 |
| June | 11·13 | 10·36 | 10·45 | 10·95 |
| July | 11·93 | 11·86 | 11·29 | 11·70 |
| August | 11·54 | 11·63 | 10·27 | 11·33 |
| September | 11·39 | 11·51 | 11·14 | 11·33 |
| October | 11·29 | 11·18 | 10·94 | 11·13 |
| Six month average | 11·34 | 11·41 | 10·75 | 11·15 |

## PAYMENT FOR MILK

### Basis of Payment

All milk delivered to cheese factories must, according to law, be paid for on a butter fat basis or a butter fat plus two basis. The " plus two " method of payment was adopted in order to give consideration to the solids not fat (chiefly casein) in the milk. However, butter fat, being the most valuable constituent of whole milk, many dairy specialists consider that the producer receives an equally fair return when paid on that basis only.

Factories differed in the basis of payment and practices varied in different parts of Ontario. In the eastern sections it was found that 56 out of the 68, or practically 85 per cent of the factories, paid on a butter fat test only. In the central area one-third of the factories adopted the fat plus two basis of payment and in Western Ontario all but one of the 27 factories paid on this basis. In Central Ontario where some differences of opinion existed concerning the fairness of the two bases, many factories alternated the two methods from year to year. Considering all factories, about 62 per cent paid on the fat basis only (table 37).

TABLE 37.—Number of Factories Paying on "Fat" and "Fat Plus Two" Basis

| Area | Number of Factories | Number of Factories paying on | |
|---|---|---|---|
| | | Fat Test | Fat Plus 2 Test |
| Eastern | 68 | 56 | 12 |
| Central | 30 | 20 | 10 |
| Western | 27 | 1 | 26 |
| Totals | 125 | 77 | 48 |

Every factory is required to have milk testing equipment, including a separate bottle for each patron. Every day a sample of the patron's milk is placed in this bottle and at the end of each month a qualified man, generally the cheese instructor for the district, tests the milk for its butter fat content. The patron is then paid on the basis of the number of pounds of fat determined.

### Net Returns to Patrons

Deducting the cash charges for manufacturing from total factory receipts the total net returns for 125 factories was $1,874,132.37. This amount when distributed among the patrons averaged $14.993.06 per factory and $382.48 per patron. Patron returns in smaller factories only averaged $209.55 while the amounts increased with each size group until in the 175 ton and over class an average of $569.71 was received (table 39).

The average return per hundredweight of milk for all factories was $0·795. The amounts fluctuated for factories of different sizes. The figure for the smallest group producing under 25 tons of cheese was ·753 which was considerably below the average. In the next two size groups the average returns were above the average for all factories and in the class producing between 100 to 124·9 tons the return per hundredweight was ·712, the lowest of any group. From that point on an increase occurred with the last two size groups of factories having returns above the average.

It was pointed out in discussing the price received per pound of cheese that distance from the Montreal market was perhaps one reason for the lower returns for Western Ontario factories. As these factories were all in the groups of larger factories the returns per hundredweight of milk would thus tend to be lower. Despite this fact and the further fact that factories in Western Ontario operate during winter months when prices are lower, the price received per hundredweight of milk compares favourably with the smaller factories for the reason that expenses of manufacturing are somewhat lower in the larger factories due to greater volume handled.

It was found also that hauling charges per hundredweight of milk decreased rapidly as the size of factory increased. The rates presented in Table 38 are estimates based on data obtained from each factory record. Deducting these charges from the return per hundredweight of milk it was found that the larger factories were returning considerably more to the patrons.

Had total charges instead of cash expenses been deducted from total receipts returns per hundred pounds of milk would have been slightly lower. However, by deducting cash charges the resulting figures indicate the amount patrons actually received even though interest and depreciation costs were not fully met.

## Time of Settlement

The time of settlement varied among the factories although the majority paid the producers every month or four weeks. In Central and Western Ontario practically all paid on a monthly basis while in Eastern Ontario the semi-monthly method was adopted by 28 out of the 68 factories studied.

TABLE 38.—Time of Settlement of Cheese Factory Accounts

| District | Number of Factories | Number of Factories Paying on | |
|---|---|---|---|
| | | Monthly Basis | Semi Monthly Basis |
| Eastern | 68 | 40 | 28 |
| Central | 30 | 28 | 2 |
| Western | 27 | 23 | 4 |
| Total | 125 | 91 | 34 |

TABLE 39.—Net Returns to Patrons per Season and per Hundredweight of Milk

| Size of Factory (tons of cheese) | Number of Factories | Net Returns | | | Average per cwt. Milk | Hauling Charges per cwt. Milk[1] | Returns less Hauling Charges per cwt. Milk | Difference from Average Return |
|---|---|---|---|---|---|---|---|---|
| | | Total | Average per Factory | Average per Patron | | | | |
| | | $ | $ | $ | $ | $ | $ | |
| Under 25.............. | 6 | 23,678·77 | 3,946·46 | 209·55 | ·753 | ·139 | ·614 | —·076 |
| 25— 49·9.............. | 35 | 238,809·06 | 6,823·12 | 268·42 | ·829 | ·134 | ·695 | +·005 |
| 50— 74·9.............. | 37 | 411,261·42 | 11,115·17 | 306·00 | ·801 | ·109 | ·692 | +·002 |
| 75— 99·9.............. | 11 | 169,624·30 | 15,420·39 | 381·18 | ·785 | ·101 | ·684 | —·006 |
| 100—124·9.............. | 12 | 232,456·28 | 19,371·36 | 391·34 | ·712 | ·095 | ·617 | —·073 |
| 125—149·9.............. | 7 | 169,811·00 | 24,258·71 | 417·23 | ·795 | ·080 | ·715 | +·025 |
| 150—174·9.............. | 8 | 239,537·82 | 29,942·23 | 541·94 | ·800 | ·107 | ·693 | +·003 |
| 175 and over........... | 9 | 378,853·72 | 42,094·86 | 569·71 | ·810 | ·091 | ·719 | +·029 |
| Total or average...... | 125 | 1,874,132·37 | 14.993·06 | 382·48 | ·795 | ·105 | ·690 | .......... |

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[1] Actual cost of hauling on milk routes plus calculated cost of hauling by patrons (see tables 41-43).

## COST OF HAULING MILK

### Methods of Computing Costs

The following data were secured in regard to hauling: (1) number of patrons and distance from factory; (2) number using cars and time required to deliver milk for each distance; (3) number using horse vehicles and time required to deliver milk for each distance; (4) time taken, cost and number of patrons on milk routes for each distance.

From this basic information and estimates of the value of man labour, horse labour and equipment, the cost of hauling milk per hundredweight and per day was computed. The cost per day for varying distances was also obtained.

The rates used to obtain the cost figures were as follows: man labour and board 17·2 cents an hour; this figure was obtained from the *Labour Gazette* being the average wage paid to farm labourers for 1931; horse labour 9·26 cents per hour, this being the figure obtained from a survey on power costs made in Western Canada in 1931, and which conforms closely with that of the Dominion Experimental Farms for that particular year; interest, depreciation and repairs for wagons at an estimated cost of $2.50 per year. Cost of operating motor vehicles was taken at 6 cents per mile.

### Relation of Costs to Volume of Milk Hauled

Information from which costs could be computed was obtained from 102 factories. It was found that the average cost per ton of milk hauled by all methods varied from $2.78 for factories in the smallest group to $1.60 per ton in the 125—149·9 ton class. The cost in the next largest group rose to $2.14 and fell to $1.82 in the 175 ton and over class. The average cost per ton for all factories was $2.11. On a cost per hundredweight basis the same trend occurred, the range between the highest and lowest average cost being 13·9 to 8·0 cents. The average for all was 10·5 cents. Cost of hauling decreased rapidly as the volume of milk increased (table 40).

TABLE 40.—Total Hauling Costs and Cost per Ton and per Hundredweight in Factories of Different Sizes

| Size of Factory (tons of cheese) | Number of Factories | Total Pounds Milk | Total Cost | Cost per Ton | Cost per Hundred Weight |
|---|---|---|---|---|---|
| | | | $ | $ | cts. |
| Under 25 | 6 | 3,142,758 | 4,376·23 | 2·78 | 13·9 |
| 25— 49·9 | 33 | 26,814,969 | 35,931·93 | 2·68 | 13·4 |
| 50— 74·9 | 28 | 38,200,971 | 41,458·46 | 2·18 | 10·9 |
| 75— 99·9 | 9 | 17,605,020 | 17,816·89 | 2·02 | 10·1 |
| 100—124·9 | 9 | 24,530,716 | 23,218·67 | 1·90 | 9·5 |
| 125—149·9 | 4 | 12,015,360 | 9,588·43 | 1·60 | 8·0 |
| 150—174·9 | 7 | 26,296,385 | 28,102·15 | 2·14 | 10·7 |
| 175 and over | 6 | 32,874,096 | 30,072·41 | 1·82 | 9·1 |
| Total or average | 102 | 181,480,275 | 190,565·17 | 2·11 | 10·5 |

Grading Cheese at Montreal.

## Cost of Wagon Route Hauling

A total of 32 factories out of 125 had a portion or all of the milk hauled by the route method. Routes were generally auctioned off to private individuals who agreed to haul at so much a trip or per ton or standard (3,000 pounds). Wagons were generally supplied by the patrons, while trucks were more often owned by the hauler.

In table 41 the costs of 99 wagon routes are summarized. The return miles per trip are seen to vary from 2 to 15 miles and the average number of patrons from 2 to 17 per route. The majority of routes were from 4 to 8 miles on a return trip basis. The average cost per patron varied from $19.20 to $32.39. For those charging on a per trip basis the range in costs were $1.19 to $2.64 per trip, these figures representing the charges on the 3 and 15 mile route respectively. The cost per hundredweight of milk ranged from 5·25 to 14·95 cents and per ton from $1.05 to $2.99. The average cost per patron per day varied from 12 to 22 cents. The average cost per ton for all wagon routes was $1.74 and per hundredweight 8·7 cents.

TABLE 41.—Summary Statement of Hauling Costs on 99 Wagon Routes

| Return Miles per Route | Number of Routes | Average | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Number of Patrons on Route | Hours Taken per Trip | Number Trips taken | Cwt. Milk per Load | Cost per Patron per Season | Cost per Cwt. | Cost per Ton | Cost per Patron per Day |
| | | | | | | $ | cts. | $ | cts. |
| 2 | 3 | 2·0 | 1·0 | ........ | ........ | 32·39 | 5·25 | 1·05 | ........ |
| 3 | 7 | 6·3 | 1·6 | 143 | 17·6 | 30·51 | 8·56 | 1·73 | 21 |
| 4 | 14 | 8·6 | 3·5 | 132 | ........ | 25·05 | 6·35 | 1·27 | 20 |
| 5 | 17 | 6·9 | 3·1 | 135 | 15·8 | 30·72 | 9·85 | 1·97 | 22 |
| 6 | 15 | 6·9 | 3·0 | 139 | 9·9 | 29·34 | 11·25 | 2·25 | 22 |
| 7 | 11 | 8·4 | 4·0 | 144 | 17·5 | 22·21 | 9·00 | 1·80 | 18 |
| 8 | 16 | 9·4 | 4·5 | 148 | ........ | 29·84 | 7·15 | 1·43 | 15 |
| 9 | 2 | 7·5 | 4·5 | ........ | ........ | 19·87 | 7·25 | 1·45 | ........ |
| 10 | 3 | 10·0 | 4·5 | 168 | 12·8 | 32·17 | 14·95 | 2·99 | ........ |
| 11 | 3 | 14·0 | 4·5 | 124 | 24·3 | 19·20 | 8·30 | 1·66 | 12 |
| 12 | 5 | 12·0 | 4·6 | 167 | 24·2 | 20·90 | 7·70 | 1·54 | 12 |
| 14 | 2 | 14·0 | 4·5 | 168 | ........ | 21·26 | ........ | ........ | 12 |
| 15 | 1 | 16·0 | 5·5 | 179 | 28·5 | 29·15 | 8·30 | 1·66 | 16 |

Average cost per ton all routes $1.74; per cwt. 8·7 cents.

## Costs of Hauling by Trucks

On 29 of the routes trucks were used to haul the milk. The return trips varied from 2 to 20 miles with the majority being about 10 miles. The number of patrons served per route ranged from 3 to 22. Costs per hundredweight of milk varied from 6·25 to 18 cents and per ton from $1.25 to $3.60. The average cost per ton for all truck routes was $1.90 and per hundredweight 9·5 cents (table 42).

TABLE 42.—Summary Statement of Hauling Costs on 29 Truck Routes

| Return Miles per Route | Average | | | | | | |
|---|---|---|---|---|---|---|---|
| | Number of Routes | Number of Patrons on Route | Pounds Milk Hauled per Month | Hours Taken per Trip | Cost per Patron per Season | Cost per Cwt. | Cost per Ton |
| | | | | | $ | cts. | $ |
| 2 | 1 | 6·0 | 52,000 | 1 | 14·43 | 7·0 | 1·40 |
| 3 | 2 | 4·5 | 15,000 | 1 | 18·06 | 6·25 | 1·25 |
| 6 | 3 | 6·0 | 32,369 | 1½ | 34·88 | 11·6 | 2·32 |
| 7 | 1 | 6·0 | .......... | 2 | .......... | 7·9 | 1·58 |
| 8 | 3 | 8·0 | 39·000 | 2¼ | 46·75 | 10·0 | 2·00 |
| 9 | 1 | 3·0 | .......... | 2 | 24·80 | 8·9 | 1·78 |
| 10 | 9 | 10·4 | 48,000 | 2 | 29·60 | 8·5 | 1·69 |
| 11 | 2 | 5·0 | 33,231 | 2¾ | 54·60 | 8·5 | 1·70 |
| 12 | 4 | 14·0 | 90,000 | 3½ | 29·48 | 12·0 | 2·40 |
| 13 | 1 | 22·0 | 90.000 | 3 | 13·90 | 7·5 | 1·50 |
| 14 | 1 | 12·0 | .......... | 2 | 22·17 | 8·3 | 1·66 |
| 20 | 1 | 10·0 | 24,000 | 4 | 51·84 | 18·0 | 3·60 |

Average cost per ton for all truck routes: per cwt. 9·5 cents; per ton $1.90.

## Cost per Patron for Milk Hauling

When a value is put on the time taken by individual patrons to haul their milk the costs of hauling are actually higher than if a number of patrons group together and pay some one to do the hauling for them.

For those patrons residing within one mile of the factory, however, the cost per season was practically the same whether the milk was hauled individually or by the route method. As the distance increased to the factory the costs per season and per day for individual hauling also rose. For those who used horses the increase was from $35.51, for under one mile to $139.75 for 4 miles for the season. The cost per day likewise increased from 16 to 62 cents. Individual hauling costs by motor cars were about the same as for wagon hauling. Wagon route hauling costs, however, remained practically the same for each distance, that is, they were about $30 for the season and 21 cents per day for the average patron. The cost of hauling tended to rise with every increase in distance from the factory (table 43).

TABLE 43.—Average Cost per Patron for Milk Hauling

| Distance from Factory (miles) | Cost Individual Hauling* | | | | Cost Route Hauling | | | |
|---|---|---|---|---|---|---|---|---|
| | Patrons using Horses | | Patrons using Truck or Car | | With Horses | | With Trucks | |
| | Per Season | Per Day | Per Season | Per Day | Per Season | Per Day | Per Season | Per Day |
| | $ | cts. | $ | cts. | $ | cts. | $ | cts. |
| Under 1 | 35·51 | 16 | 28·60 | 11 | 32·39 | — | 14·43 | — |
| 1—2 | 59·82 | 26 | 64·73 | 26 | 30·51 | 21 | 18·06 | — |
| 2—3 | 95·38 | 40 | 104·84 | 41 | 27·88 | 21 | 34·88 | — |
| 3—4 | 139·75 | 62 | 163·96 | 56 | 29·34 | 22 | — | — |

*These are assumed costs while the route hauling charges were actually paid. Average cost per ton individual hauling—$2.28; per cwt.—11·4 cts.

## Relation to Larger Factories

If, in order to produce more economically, cheese patrons decide that larger factory units are necessary then the question of milk hauling must be considered. At present the majority of the patrons live within two miles of a factory and thus are able to deliver each morning's milk themselves. Larger factories would increase the area of the factory district and necessitate either longer hauls by patrons or organization of milk routes for the hauling of milk at contract rates.

The charge or cost of this route hauling must be balanced by a sufficiently larger net return from the cheese to meet the cash outlay or else patrons will not take kindly to the route method and no advantage will have been gained through amalgamation of factories.

Many factory owners or makers prefer to have patrons haul their own milk for several reasons—they have less bother with the whey because individual farmers can take their own cans back and thus stop undue contamination of milk cans; they can deal more easily with patrons who persist in bringing in poor quality milk for it is possible to show the defects to such persons, whereas in factories operating milk routes the maker must telephone or send a note to patrons whose milk is below standard.

The patrons for the most part take an active interest in their factory. In many cases it is the centre of social and business gatherings. It is a common meeting place for farmers every morning and for this reason many of them are loath to have it amalgamated into a larger unit with other factories.

Many claim that the hauling of milk from long distances to the factory impairs the quality especially during very hot weather. This is a debatable point, however, for others state that if milk is cared for properly on the farm an extra mile or two will not affect the quality.

One of the biggest factors to consider in a discussion of route hauling is the road question. In some parts of Ontario country roads are not suited to heavy traffic during certain seasons of the year. The farmer with a light wagon may be able to drive to the factory with his own milk but heavily loaded trucks or horse vehicles containing many cans would experience difficulty. Thus, before the area served by a factory can be enlarged the conditions of roads must be taken into account.

Recognizing all the arguments against larger units and, consequently, route hauling methods, however, something must be done to cope with the present situation. Changing conditions such as competition from creameries, use of trucks, competition from condensaries and market milk stations all affect the cheese factory business. If these competing concerns continue to offer a higher price to the producers of milk, then factories must produce more cheaply in order to compete with them. A logical step in this direction would be to produce in larger factories for it has been demonstrated that substantial reductions in cost of manufacture can be effected if this is done.

## COMPETITION FOR MILK FOR OTHER USES

A total of 120 factories supplied information regarding the competition from sources other than cheese factories for the use of milk. Two of the 120 had no competition whatsoever.

Creameries were the largest competing agency for cheese factory milk. In the 118 factory districts, 277 instances of competition from this source were cited which made an average of 2·35 creameries per factory district. Many of the creameries, however, solicited business in more than one factory district so the actual number of creameries would be very much less. In 1930, a total of 101 patrons left the 118 cheese factories to sell to creameries.

City milk plants were next in importance in regard to competition. Factories reported 92 instances of competition from this source and a total of 34 patrons left cheese factories to deal with milk plants.

Competition from condensaries was reported in 20 instances but no patrons were drawn away from factories during 1931 by such competitors.

Very slight interchange of patrons took place between one cheese factory and another as only 22 cases were listed in the whole 118 factories.

To offset the exodus of patrons from the cheese factories, in 1931 a total of 107 returned from the other concerns. As 135 were said to have stopped in 1930, it may be said that the majority returned again.

The main reason given for the 135 patrons leaving in 1930 was because of low prices in the cheese business. Fifty made this claim. It was also thought that butter prices were going to rise and thus return more per hundred pounds of milk than could be obtained from the manufacture of cheese.

In Western Ontario a number of patrons returned from condensaries in 1931 but in Eastern and Central Ontario it may be said that the majority returned from creameries and some from city milk plants.

## EDUCATIONAL STANDING OF MAKERS

Cheese making is a specialized business and it requires trained men to manufacture a high quality product. This training has been acquired by cheesemakers through experience as helpers in factories and through special training at agricultural and dairy schools. More and more emphasis is being placed upon a dairy school education.

Apart from special education the majority of makers received a public school training. Only 12·8 per cent attended high school classes. Over 55 per cent of the makers had received no special education after leaving public school. These makers apparently learned the cheese business through apprenticeship to experienced makers. A total of 37·2 per cent attended dairy school, 2·4 per cent attended short courses at dairy school and 1·6 per cent had a business school training. For those who did attend dairy school the time of receiving the training ranged from 1900 to the present time. (Tables 44 to 46.)

TABLE 44.—General Educational Standing of Cheese Makers

| Highest Standing Obtained | Number | Per cent of Total |
|---|---|---|
| Public School | 87 | 69·6 |
| 1 year High School | 8 | 6·4 |
| 2 years High School | 5 | 4·0 |
| 3 years High School | 3 | 2·4 |
| No report | 22 | 17·6 |
| Total | 125 | 100·0 |

TABLE 45.—Special or Technical Education Received by Cheese Makers

| | Number | Per cent of Total |
|---|---|---|
| No special education | 69 | 55·2 |
| Dairy school | 44 | 37·2 |
| Short course dairy school | 3 | 2·4 |
| Business course | 2 | 1·6 |
| No report | 7 | 5·6 |
| Total | 125 | 100·0 |

TABLE 46.—Year, Dairy School Training Obtained

| —— | Number |
|---|---|
| Before 1900 | 4 |
| 1910—1914 | 4 |
| 1915—1919 | 5 |
| 1920—1924 | 4 |
| 1925—1929 | 8 |
| 1930 and over | 4 |
| Time not stated | 15 |
| Total | 44 |

## CERTIFICATES HELD BY CHEESEMAKERS

Cheesemakers receive a first class, second class or permit certificate depending upon the quality of cheese made in the year preceding the one for which the certificate is issued. For men working for the first year, only a permit is issued until they have proven their ability. The Provincial Department of Agriculture in Ontario keeps a record of the quality and amount of cheese made in each factory and the district cheese inspector recommends the issuing of the certificates each year.

For the 125 makers from whom data were collected 76·8 per cent of them had first class certificates, 20·8 per cent had second class and 2·4 per cent had permits in 1931. About three-quarters of the owner makers had first class and one-quarter second class certificates. A lesser proportion of hired makers had first class certificates, while over 90 per cent of the contract makers possessed them. The higher proportion of first class certificates held by contract makers indicates that men of more experience and perhaps more ability are being hired on this basis. As can be seen in Table 48, a larger number of makers also hold certificates for buttermaking and milk testing.

TABLE 47.—Certificates Held by Cheese Makers, 1931

| Certificate Held | Owner Maker | | Hired Maker | | Contract Maker | | Total in Groups | Per cent of Total |
|---|---|---|---|---|---|---|---|---|
| | Number | Per cent In Group | Number | Per cent In Group | Number | Per cent In Group | | |
| First | 41 | 73·2 | 26 | 68·4 | 29 | 93·5 | 96 | 76·8 |
| Second | 14 | 25·0 | 10 | 26·3 | 2 | 6·5 | 26 | 20·8 |
| Permit | 1 | 1·8 | 2 | 5·3 | — | — | 3 | 2·4 |
| Total | 56 | 100·0 | 38 | 100·0 | 31 | 100·0 | 125 | 100·0 |

TABLE 48.—Number of Makers Having Milk Testing and Butter Making and Milk Testing Certificates

| Certificate Held | Type of Maker | | | |
|---|---|---|---|---|
| | Owner | Hired | Contract | Total |
| Milk testing | 28 | 19 | 12 | 59 |
| Butter making and milk testing | 7 | 4 | 9 | 20 |
| None held | 19 | 13 | 7 | 39 |
| No report | 2 | 2 | 3 | 7 |
| Total | 56 | 38 | 31 | 125 |

## LENGTH OF EXPERIENCE AS MAKERS

The years of experience or continuous working period of cheesemen varied from under 5 years to over 45 years. Data presented in Table 49 indicate that 52·0 per cent had less than 15 years' experience, 31·2 per cent had between 15 and 29 years and 16·8 per cent had over 30 years' experience. Only 15·2 per cent had been makers for less than 5 years which fact clearly indicates that as far as experience is concerned the majority of makers should be qualified to carry on the business of cheese making. From the grading returns on quality shown on page 31 this fact is evident. For each class of maker, the years of experience varies but the relatively large number—11 out of 38—of hired makers with less than 5 years of experience indicates that more men enter the business on this basis than as contract or owner makers.

TABLE 49.—Length of Experience as Makers

| Period | Owner Makers | Hired Makers | Contract Makers | Total Number | Per cent of Total |
|---|---|---|---|---|---|
| Under 5 years | 3 | 11 | 5 | 19 | 15·2 |
| 5— 9·9 | 11 | 7 | 8 | 26 | 20·8 |
| 10—14·9 | 11 | 4 | 5 | 20 | 16·0 |
| 15—19·9 | 7 | 2 | 4 | 13 | 10·4 |
| 20—24·9 | 7 | 3 | 3 | 13 | 10·4 |
| 25—29·9 | 6 | 6 | 1 | 13 | 10·4 |
| 30—34·9 | 5 | 2 | 2 | 9 | 7·2 |
| 35—39·9 | 2 | 1 | 2 | 5 | 4·0 |
| 40—44·9 | 1 | 1 | 1 | 3 | 2·4 |
| 45 and over | 3 | — | — | 3 | 2·4 |
| No report | — | 1 | — | 1 | 0·8 |
| Total | 56 | 38 | 31 | 125 | 100·0 |

## SUMMARY AND CONCLUSIONS

### Factory Consolidation

The cost of manufacturing cheese is closely related to the volume of output. The extreme difference in costs between the highest and lowest cost factories included in the survey was 1·68 cents per pound or the equivalent of about 15 cents per hundred pounds of milk. At prices prevailing in 1931 this represents a difference of about 20 per cent. The difference between the costs incurred in the group of factories producing less than 25 tons annually and those of factories with an average output of 175 tons per year was 1·16 cents per pound or approximately 10 cents per hundredweight of milk.

These data indicate that in the large and efficiently operated factories cheese was being made at a much lower cost than in the smaller units. Such results were achieved by making maximum use of labour, plant and equipment and since in this business any benefit thus obtained is reflected directly in the price paid for milk it would appear desirable to increase the volume of business wherever possible. In many cases this could best be achieved by the amalgamation of factory districts and the closing of unnecessary factories. This in turn would mean longer hauls by patrons or the organization of milk routes. In most instances, where the conditions of roads permit, the milk could be hauled by contract at a cost which, added to the expense of plant operation would still be less than the cost of making cheese in small factories.

Where the conditions of roads do not permit of the hauling of heavy loads such as would be necessary if milk routes were organized and where patrons do not wish to haul their own milk longer distances, increased volume would have to be obtained by lengthening the period of factory operation, by increasing the size of herds and production per cow or by diverting milk which now goes to city milk plants, creameries or condensaries.

It is appreciated that there are other things to consider in connection with factory amalgamation. Some of these have been referred to in the body of this report. They include also such matters as suitability of the district to intensive dairying, the value of the cheese factory as a community enterprise and the management and financial difficulties which may be involved in a program of consolidation. Nevertheless, there are many cases where the area served by a factory could be enlarged advantageously and patrons would be well advised to give careful thought to the question.

### Other Results

Next to the question of cost of manufacturing cheese major interest among patrons centres in the contracts with the cheese makers and the amounts received by them. In this connection it was noted that patrons often referred to the contract rate as the amount received by the maker whereas, in most instances, where the rate was high the expenses paid by the maker were in proportion. On the whole it would appear that the amounts received by makers were not unreasonable although bearing a different relationship to the income of patrons than would exist in a period of higher prices.

Of the three classes of makers those operating on a contract basis appeared to be receiving most income. Hired operators received a little less while owner makers, if adequately reimbursed for depreciation and use of capital, received less for their labour than either of the other classes of operators.

Considerable variation in the average prices received for cheese by different factories was found. This was in part due to distance of factories from Montreal, the primary market, and partly due to length of operating season and relation to price but it was also found that within a given area there was considerable difference in the average prices received by factories. Quality of cheese was responsible for some of this difference.

A comparison of quality of cheese made in different sized factories, as revealed by grade statements, indicated that the medium sized and large plants turned out a better quality product than the very small units. Eastern Ontario had a larger percentage of these small plants, and produced a smaller percentage of number one cheese than either Central or Western Ontario.

In Eastern Ontario most of the factories paid for milk on a straight butter-fat basis while in Western Ontario the "fat plus two" basis was most commonly used. In Central Ontario the practice was divided.

The amounts paid to patrons by factories of different sizes ranged from an average of $209.55 to $569.71 for the season. Although the average price paid for milk was higher in the case of medium and large sized plants, the difference was due mainly to the fact that these plants operated a longer season and that farms and herds were larger and production per cow greater in the areas which they served.

Most of the larger plants separated whey cream and made whey butter. They were able to do this because their volume was sufficient to justify the purchase of necessary equipment. The added revenue from this source substantially reduced operating costs.

The average cost of hauling milk was 10·5 cents per hundred pounds. The cost of hauling with horses and wagon was slightly less than by truck in the case of milk routes. The cost of hauling by patrons, if average wages and horse and equipment costs are considered, was higher than the cost incurred by route hauling. However many farmers do not consider that this basis of computing costs should be adopted since hauling is frequently done by the younger members of the family. Moreover, even though adult labour is used it is pointed out that such labour must be maintained in any case in connection with farm operations.

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